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ABSTRACT

The 51 papers included in this symposium proceedings address gender equity issues in higher education, as well as some of the current research and programming designed to advance the education of girls and women in K-12 and higher education. Papers focus on six topics: (1) higher education curricula and classroom strategies that promote equity; (2) authority, policy, and empowerment in higher education; (3) strategies to effect change in higher education; (4) the roles of self-image and self-esteem in achieving equity; (5) ways to encourage girls in math and science; and (6) equity issues in K-12 education. Individual papers cover issues such as: faculty governance; dyadic interactions; women and authority; the campus living environment; the equitable workplace; school-college research and curriculum intervention; women in graduate school; maternity leave policies; gifted girls; mathematics and science education for girls; electronic intergenerational connections; gender equity; student-centered classrooms; nontraditional recruitment and vocational education; reentry women and their spouses; career paths; male versus female career choices; educational experiences of disadvantaged women; skill standards; tenure, professional relations, and strategic choices; women's studies; nursing education; women's athletics and Title IX; multiculturalism; and women administrators. Included also are a conference agenda and a list of committee assignments. Appended are a list of papers proposed but not included, and a list of 1994-95 American Association of University Women college/university members. (Individual papers contain references). (CH)

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achieving gender equity in the classroom and on the campus
The Next Steps

AAUW Pre-Convention Symposium

Disney's Contemporary Resort
Orlando, Florida
June 22-24, 1995

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The symposium and proceedings, "Achieving Gender Equity in the Classroom and on the Campus -- The Next Steps," is the American Association of University Women's latest initiative in a century-long tradition of research focused on women in higher education.

AAUW's first research study, commissioned in 1885, debunked the myth that education was harmful to a woman's reproductive health. Since this original study, AAUW has commissioned several other research projects, including a study in 1970 that found sex discrimination to be rampant in higher education, a 1992 study which shattered the assumption that girls and boys are treated equally in American public schools, and a 1993 report that examined sexual harassment in middle schools.

Also in 1993, AAUW hosted its first preconvention symposium to discuss gender equity issues in higher education. Whereas the first symposium was focused on defining the problems of gender equity in higher education, today's symposium aims to take those findings one step further by examining current research and programming that have proven successful in advancing the education of girls and women in K-12 and higher education.

The symposium begins with a welcoming address from Dr. Kelvie Comer, Dean of Education, Health, and Human Services and Chair of AAUW's College/University Relations Committee. Dr. Comer is followed by the opening panel discussion, *Why Are Girls Still Getting Shortchanged? Confronting the Backlash*.

On Friday, women and men from U.S. and Canadian institutions will present their original research on gender issues relating to education. The concurrent paper and panel sessions will focus on six tracks:

1. Higher education curricula and classroom strategies that promote equity
2. Authority, policy, and empowerment in higher education
3. Strategies to effect change in higher education
4. The roles of self-image and self-esteem in achieving equity
5. Ways to encourage girls in math and science
6. Equity issues in K-12 education.

The keynote luncheon address, *Strategies -- Making Change Happen*, will be presented by Bernice Sandler, Senior Scholar in Residence, National Association of Women in Education. The symposium will conclude with the plenary session, *The Continuing Discrimination in Higher Education*.

This symposium provides an excellent forum to discuss the issues that matter most to you in your careers in education. Thank you for your participation and support of this symposium. And thank you for being committed to supporting educational equity for women and girls.

Carolyn Benz　　　　Linda Freed

Symposium Co-Chairs

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Thursday ***12:00-3:00***		
Registration	**Fantasia Lobby**	
Opening Remarks	Nutcracker Ballroom	Kelvie Comer, College of Education, Health, and Human Services, Central Michigan University, and Chair, AAUW College/University Relations Committee
Plenary Session	Nutcracker Ballroom	***Why Are Girls Still Getting Shortchanged? Confronting the Backlash*** Nancy Benda, Director, Equal Education Opportunity Program, Florida Department of Education Sister Lucia Haas, S.N.D., Principlal, Cardinal Mooney High School Sharon Latkovich, Assistant Professor of Business Administration, Ashland University

Friday ***9:00-10:15***		
Track A: Higher Education Curricula and Classroom Strategies that Promote Equity	Session A1: Fantasia A	***Model Programs to Promote Equity*** 1. Bringing Women's Accomplishments to the Classroom. Dian Rae Lopez, Computer Science, Ferolyn Angell, Academic Assistance Center, and Stacey Parker Aronson, Spanish, University of Minnesota, Morris. 2. Gender Diversity in Engineering Education at the University of Central Florida. Parveen Wahid, Electrical and Computer Engineering, University of Central Florida. 3. Nontraditional Recruitment of Young Women. Denis Kiely, project coordinator, Tennessee Opportunities, Tennessee Technological University.
Track B: Authority, Policy and Empowerment in Higher Education	Session B1: Fantasia B	***The Feminized Disciplines*** 1. Perception of Sexism in Nursing Education: The First Step Toward Achieving Equity. Teresa Shellenbarger, Indiana University of Pennsylvania. 2. Gender and Music Administration in Higher Education. Sandra Featherman, Vice Chancellor of Academic Administration, and Judith Kritzmire, Dept. of Music, University of Minnesota, Duluth.
Track C: Strategies to Effect Change in Higher Education	Session C1: Fantasia C	***Leadership Strategies that Work*** 1. Career Paths and Responsibilities of Graduate Deans. Marion Kilson, Dean of the Graduate School. 2. Findings from the Proceedings of the Task Force for the Status of Women, University of Louisville. Deborah G. Wilson, Assistant Provost, and Linda T. Shapiro, Associate Provost, University of Louisville.
Track D: The Roles of Self-Image and Self-Esteem in Achieving Equity	Session D1: Fantasia D	***Fostering Self-Esteem: Programs and Methods*** 1. "What's School Got to do With it?" Adult Women's Reflections and Suggestions on the Role of Education in Developing Self-Esteem. Victoria DeFrancisco and April Chatham-Carpenter, Women's Studies, University of Northern Iowa. 2. The Development of Self Esteem through Electronic, Intergenerational Connections. Marion Harris Fey, State University of New York at Geneseo. 3. Sustaining Girls' Voices: The Women and Girls' Collaborative Theater Project. Sarah Taylor, Arizona State University.
Track E: Encouraging Girls in Math and Science	Session E1: Fantasia E	***Training Teachers to Promote Equity*** 1. Creating a More Equitable Computing Climate. Sandra Madison, Mathematics & Computing, University of Wisconsin - Stevens Point . 2. S.M.A.R.T. Girls for the 21st Century. Joanne R. Carlson, Melanie Felton and Norma Gier, College of Saint Mary.
Track F: Equity Issues in K--12 Education	Session F1: Fantasia F	***Panel: Gender Equity, School-to-Work, and Industry Skills Standards: Shaping a New Discourse on the Education and Employment of Women and Girls.*** Moderator: Vivian Gilfroy, Director, The Center for Education, Employment and Community, Education Development Center, Inc., Newton MA. Panelists: Katherine Hanson, Director, WEEA Publishing Center, EDC, Inc. and Joyce Malyn-Smith, Director, Skills Standards Project, EDC, Inc.

Friday ***10:30-11:45***	▨	
Track A: **Higher Education Curricula and Classroom Strategies that Promote Equity**	Session A2: Fantasia A	***Panel: Negotiating the Maze: Gender and Multicultural Education*** Susan Shaffer, Associate Director, and Jill Moss Greenberg, Director of Multicultural Programs, The Mid-Atlantic Center, Mid-Atlantic Equity Consortium, Inc.
Track B: Authority, Policy and Empowerment in Higher Education	Session B2: Fantasia B	***Career Dynamics for Women in Higher Education*** 1. Toward Tenure: The Influence of Same Gender Dynamics on Professional Relations and Strategic Choices. Colette Patt, University of California, Berkeley. 2. Women Working Together. Elaine Engelhardt, Director, Center for Ethics, and Lucille Stoddard, Vice President of Academic Affairs, Utah Valley State College. 3. Decision Making and the Female Faculty Member. Karen I. Case, College of Education, University of Hartford.
Track C: Strategies to Effect Change in Higher Education	Session C2: Fantasia C	***Meeting the Needs of Women Students*** 1. What Do Student Moms Want? (And Need?): A Study of Child Care Practice and Issues for College and University Women in Louisiana. Elizabeth Torre-Reck, School of Social Work, Tulane University. 2. Reconstruction of Genderized Realities: Perception Changes of Reentry Women and Their Spouses During the Process of Higher Education. Joan Thompson Kerber, Director of Counseling, Sauk Valley Community College. 3. "How Long Ya' In For?" The Use and Abuse of Women in Graduate School. Nancy J. Federman, Sociology, San Diego Mesa College.
Track D: The Roles of Self-Image and Self-Esteem in Achieving Equity	Session D2: Fantasia D	***Systemic Inequity and Authority Roles*** 1. Seeking the Middle Ground: Helping University Teaching Assistants Deal with Gender Issues. Nancy VanDevender, University of New Mexico. 2. Women, Authority and Pedagogy: Seeking to Destroy Systemic Violence. Juanita Ross Epp, Dept. of Education, Lakehead University. 3. The Family Romance and the Student-Centered Classroom: Challenges to the Female Professor. Lisa Jadwin, Dept. of English, St. John Fisher College.
Track E: Encouraging Girls in Math and Science	Session E2: Fantasia E	***Inclusive Curriculum Models*** 1. "Equity Achieved!": HORIZONS 2000, an Innovative, Field-Tested Curriculum Model for Grades 5-12. Cheryl Bartholomew, George Mason University. 2. Multiculturalism in Mathematics Instructional Materials. Iris M. Striedieck, Pennsylvania State University.
Track F: Equity Issues in K-12 Education	Session F2: Fantasia F	***Supporting Giftedness in Girls*** 1. The Perceptions and Expectations of Gifted Girls Toward Teachers' Training in Special Education in Taiwan. Su-Chun Chiu, School of Education, U.C.L.A. 2. Gifted Girls: Promise of the Future. Cecile P. Frey, Supervisor, Gifted Support Services, Lower Merion School District, Ardmore, Pennsylvania. 3. The Single-Sex Math Setting: What Happens to Gifted Girls? J. Christine Gould, University of Utah.

Friday ***12:00-1:30***	▨	
Luncheon	Nutcracker Ballroom	***Strategies -- Making Change Happen*** Bernice R. Sandler, Senior Scholar in Residence, National Association for Women in Education

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Friday 1:45 - 3:00	▨	
Track A: Higher Education Curricula and Classroom Strategies that Promote Equity	Session A3: Fantasia A	***Personal Voices: Learning from the Narrative*** 1. Documenting and Resisting Institutional Silencing: Learning from the Stories Women Tell. Kathryn Herr, Education, University of New Mexico. 2. University Students Promote Gender Equity Through Interviews and Narratives. Rose Marie Cutting, English and Education, St. Mary's University. 3. Women and Teaching: Fostering the Personal Voice in Teacher Education. Laura E. Blitzer, Health & Physical Education, and Nina Zaragoza, Elementary Education, Florida International University.
Track B: Authority, Policy and Empowerment in Higher Education	Session B3: Fantasia B	***Policy issues and Empowerment Strategies*** 1. "Growing Your Own": A Case Study of a Grass Roots Strategy to Assure Diversity Among College Faculty. Pat Whitfield, Dean, Div. of Education and Psychology, Heritage College. 2. Twenty Two Years after Legislating Equity: Education and Athletics/Sports Continue to Shortchange Women and Girls. Cindy L.A. Pemberton, Assistant Athletic Director, Linfield College.
Track C: Strategies to Effect Change in Higher Education	Session C3: Fantasia C	***Equity-Supportive Policies*** 1. Maternity Leave Policies in Research Universities. Susan Kolker Finkel, Research Associate, and Steven G. Olswang, Vice Provost, University of Washington. 2. Faculty Governance: A Vehicle for the Development of Institutional Empowerment Strategies. Dorothy Behling and Veronica Gold, Bowling Green State University.
Track D: The Roles of Self-Image and Self-Esteem in Achieving Equity	Session D3: Fantasia D	***Valuing Diversity*** 1. Feminism and Diversity: Transforming the Curriculum for Training Researchers in Education and Psychology. Donna M. Mertens, Gallaudet University. 2. Incorporating Diversity in Business Education - An Assessment. Mary Ellen Zuckerman, State University of New York, Geneseo. 3. Multicultural Training Strategies for University Graduate Teaching Assistants. Beverly Stitt and Shelley Franklin, Women's Studies, Southern Illinois University.
Track E: Encouraging Girls in Math and Science	Session E3: Fantasia E	***Model Campus-Based Projects for K-12 Girls*** 1. Keeping Doors Open in Mathematics/Science for Middle School Girls. Janis E. Murphy, Elementary & Secondary Education, Murray State University. 2. Opening the Window of Opportunity for High School Females. Margaret Phelps, Director of Rural Education, and Beverly Heath, Cumberland Career Equity Center, Tennessee Technological University. 3. Engineering Faculty Encouragement for the K-12 Girl. Lisa Anneberg and Patricia Shamamy, Electrical Engineering, Lawrence Technological University.
Track F: Equity Issues in K-12 Education	Session F3: Fantasia F	***Model Community and School-Based Projects for K-12 Girls*** 1. TARGETS: Tracking and Reaching Girls for Equity Training in Science. Frances W. Cox, Chemistry and Physics, Woodmont High School, Piedmont S.C. 2. Marie Curie Project - Past and Present Role Models. Sheryll A. Renken and Paulette Goodman, Indian Prairie School District #204, Naperville IL. 3. Girl Scouts: Discovering Ourselves in Math and Science, A Model Program for Girls. J. Lynn Wolfe, Marti Schriver, Jay Strickland, Georgia Southern College.

Friday ***3:15-4:30***		
Track A: Higher Education Curricula and Classroom Strategies to Promote Equity	Session A4: Fantasia A	***Instructional Methods that Foster Equity*** 1. Language, Power and Politics: Confronting Gender Inequities in a Research Writing Course. Jace Condravy, Women's Studies, Slippery Rock University. 2. Integrating Women's Issues into the Curriculum: A Model for the "Helping Professions." Eileen Mazur Abel, Social Work, University of Central Florida.
Track B: Authority, Policy and Empowerment in Higher Education	Session B4: Fantasia B	***Career Choices and Institutional Barriers in Higher Education*** 1. Barriers to Scholarly Productivity of Women Faculty in Illinois. Beverly Stitt, Women's Studies, Southern Illinois University. 2. Career and Familial Choices of Men vs. Women in Higher Education: The Realities of Equity. Regina Watkins, Jerri Bullard, Laura Stokes, and Lynn Gillaspie, University of North Alabama.
Track C: Strategies to Effect Change in Higher Education	Session C4: Fantasia C	***Preventing and Combatting Sexual Harassment and Sexual Violence*** 1. The Prevalence of Peer Sexual Harassment in a Small Rural College. Diane Martichuski, Division of Social Sciences, Wayne State College. 2. What is Campus Rape?: Responses of Identifying and Combatting Rape. Janet Lohmann, Sociology, University of Massachusetts. 3. Gender Issues Survey: Perceptions of Gender Equity and Campus Climate. Cassandra N. Nichols and Betty Gridley, Psychology, Ball State University.
Track D: The Roles of Self-Image and Self-Esteem in Achieving Equity	Session D4: Fantasia D	***Self Definition and Self Esteem for Women Students in Higher Education*** 1. The Role of Education in Women's Resiliency: Exploring the Educational Experiences of Successful Women from Disadvantaged Backgrounds. Pamela LePage, University of California, Berkeley and San Francisco State University. 2. University-Based Women's Centers: Confronting the Backlash. Susan Shome, The Women's Center, Virginia Tech. 3. Gender Equity Through Discovering and Asserting. Suzanne Losee, Terri Ann Whalen, Art Dowell, School of Education, Western New Mexico University.
Track E: Encouraging Girls in Math and Science	Session E4: Fantasia E	***Classroom Strategies that Promote Equity*** 1. Teaching for Gender Differences in Elementary Science. Carolyn Ledford, Education, Chatham College, and Judy Hallinen, DASH Office, Center for University Outreach, Carnegie Mellon University. 2. Gender Equity in Mathematics Instruction. Sarah Turner, Elementary Counselor, North Main Elementary School, Greenwood, AR. 3. Promoting Gender Equity in Model Instructional Programs. Gerald Meisner, Physics, and Harol Hoffman, Project Manager, Technology Tools, University of North Carolina at Greensboro.
Track F: Equity Issues in K-12 Education	Session F4: Fantasia F	***Sports and Gender Equity*** 1. Dyadic Interactions Between Physical Education Teachers and Kindergarten Students Based on Gender. Allison Y. Colvin, Trevilians Elementary School, Trevilians, VA. 2. School-College Action Research and Curriculum Intervention to Effect Change for Girls in Urban Middle-School Physical Education. Linda A. Catelli, Director, Project SCOPE, Queens College of the City University of New York.

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Saturday ***9:00 - 10:15***		
Track A: Higher Education Curricula and Classroom Strategies that Promote Equity	Session A5: Fantasia A	***Panel: The Practical Politics of the Transformational Classroom.*** Susan Morehouse, English, Vicki Eaklor, Human Studies, Linda Jones, Ceramics, Becky Prophet, Performing Arts, Francie Viggiani, Business, Alfred University.
Track B: Authority, Policy and Empowerment in Higher Education	Session B5: Fantasia B	***Panel: Principles and Practice of Structural Change: Challenging the "Usual Way of Doing Things" in University Settings.*** Carol E. Harris, University of Victoria, Cecilia Reynolds, Brock University, and Juanita Epp, Lakehead University.
Track C: Strategies to Effect Change in Higher Education	Session C5: Fantasia C	***Creating a Woman-Friendly Campus Climate: Case Studies*** 1. Chairing a Presidential Advisory Council on Women's Issues: Reflection on Year One. Mary R. Laycock, Director of Women's Studies, University of North Dakota. 2. Fostering a Woman-Friendly Campus Through an Innovative Academic/Non-Academic Living Environment. Eileen D. Bunderson and Kay B. Franz, Brigham Young University. 3. "Shadow Day" at Oklahoma City University: Building a Mentoring Network on Campus. Virginia McCombs, Honors and History, Oklahoma City University.
Track D: The Roles of Self-Image and Self-Esteem in Achieving Equity	Session D5: Fantasia D	***Creating a Girl-Friendly Climate in Schools*** 1. Girls: Voices for Equity, Voices for Change. Mary Ann Brenden, College of St. Catherine & University of St. Thomas. 2. The Influence of Gender Connotations on Children's Play and Learning. Barbara Colombo-Adams, University of Maine. 3. Teaching Gender Equity as a Social Skill in the Elementary Classroom: Primary Prevention of Sexual Harassment Through New Awareness and Skills. Katia S. Petersen, Education Consultant and Chair, MN Children's Trust Fund.
Track E: Encouraging Girls in Math and Science	Session E5: Fantasia E	***Panel: Achieving Gender Equity in Elementary Schools Begins in Colleges and Universities.*** Susan M. Chevalier, Carol Caldwell, Jenny Piaza, Elementary Education, Boise State University.
Track B: Authority, Policy, and Empowerment in Higher Education	Session B5a: Fantasia F	***Dealing with Stereotypes*** 1. The Effect of Gender Inequity and Role Socialization on RN's Attitudes Toward Interdisciplinary Collaboration. Carol Stubblefield, CHBR, Washington University School of Medicine. 2. Mediated Women: Measuring Women's Attitudes Toward Sex Role Portrayals in Television Advertising. Sheri Thompson Carder. University of Southern Mississippi. 3. Job Satisfaction and its Correlates among Women Mass Communication Educators. Beverly Suzanne Bailey, Journalism, Arkansas State University.

Saturday ***10::30-12:00***		
Wrap-Up Plenary Session	Nutcracker Ballroom	***The Continuing Discrimination in Higher Education*** Sandra Featherman, Academic Vice Chancellor, University of Minnesota-Duluth Anne Murray, AAUW Legal Advocacy Fund Plaintiff Augustine Pounds, Vice President for Student Services and Development, Anne Arundel Community College

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BRINGING WOMEN'S ACCOMPLISHMENTS TO THE CLASSROOM

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THE PROBLEM

As members of the Commission on Women at the University of Minnesota, Morris, we were aware that the contributions of women to academia, both as scholars and as subjects of study, were being overlooked to varying degrees in a variety of disciplines on our campus and elsewhere. When women were included, their contributions were often relegated to "women's studies" courses or to a given week in a course syllabus. We also perceived an inherent male bias in some textbook problems, examples and illustrations used to teach academic concepts.

This lack of presentation of women's contributions to academia and a pervasive male bias in textbooks can have different repercussions for male and female students. Not surprisingly, it is least conflictive to the male student, whose experiences are constructed as universal. The predominant context through which the world is represented is imbued with a male-centered ideology, a gendered point of view that operates in accordance with a patriarchal system. According to literary critic Patrocinio Schweickart, the idea of male becomes synonymous with the universal. Due to the fact that a majority of literary protagonists are male and many textbook examples deal with males or with male-inspired examples, a male reader identifies with and presumes the universality of his personal experience.

> For the male reader, the text serves as the meeting ground of the personal and the universal. Whether or not the text approximates the particularities of his own experience, he is invited to validate the equation of maleness with humanity. The male reader feels his affinity with the universal, with the paradigmatic human beings, precisely because he is male. (Schweickart, 41)

The female student, on the other hand, trying to make her way in a male-dominated academic discipline and faced with examples that either denigrate or exclude women, has two choices. Over time she may internalize the idea that women's contributions to the discipline are nonexistant or of lesser importance. Or she may adopt the coping mechanism of distancing herself psychically by identifying with the male point of view. A female student's institutionalized academic training often obliges her to suppress certain intellectual and cultural predispositions in her reaction to the organization and content of a particular course or of a particular text. Unfortunately for her, this can result in an intellectual cross-dressing along gender lines as she learns to adopt a masculinist critical posturing which eliminates alternate interpretations grounded in her own experiences. A female student's attempt to identify with conventional course contents and to somehow situate herself within the maze of male-inspired examples results in a phenomenon that critic Judith Fetterley defines as

> ... the *immasculation* of women by men. As readers and teachers and scholars, women are taught to think as men, to identify with a male point of view, and to accept as normal and legitimate a male system of values, one of whose central principles is misogyny. (Introduction, xx)

A PARTIAL SOLUTION

Our project seeks to address gender inequities and facilitate the development of a more inclusive curriculum on our campus. Our goal is to create easily accessible references for faculty and students on a discipline by discipline basis as a way to encourage faculty to include women's contributions in their courses. We started by calling for proposals from students to work closely with a faculty member to accomplish three things: to research and document the contributions of women in their major field of study; to examine the textbooks currently used in the discipline to determine the existence of gender bias; and, based on interviews with faculty, to collect and distribute gender-balanced examples, problems and illustrations to be used in the teaching of academic concepts. It was our goal that the student and faculty member participating could benefit immensely from such a project and that the results could be shared with both faculty and students in the discipline studied.

Our initial call for proposals generated such enthusiasm that, even though we were able to fund only one project, two other projects were carried out independently as Senior Honors Projects. The pilot project, which had the strongest proposal, was conducted in the field of chemistry. Two other projects were carried out in the fields of history and industrial relations.

The chemistry project, conducted by student Juliana Durham and faculty member Nancy Carpenter, had two components: first, to document the accomplishments of women who had contributed significantly to the field of chemistry and second, to examine the textbooks currently in use within the chemistry discipline in order to identify gender bias in the examples and illustrations used to teach chemistry concepts. With respect to the accomplishments of women in chemistry, Ms. Durham provided brief biographies of many women who had made significant contributions to the field and listed sources where more information about them could be found. With respect to the issue of gender bias, she stated that gender bias was not present in her chemistry textbooks because most examples and homework problems did not include people, only chemicals and equations. She also examined, on her own initiative, the trends in the enrollment of women in the chemistry courses offered on our campus. She determined that the level of female enrollment in chemistry courses at UMM suggested a favorable climate for women in this discipline.

Another student, Melissa Gruys, whose project was conducted in industrial relations, created extensive annotated lists of both resources by and resources about women in the field. Her lists were divided into thirteen categories: Awards and Case Studies; Benefits and Compensation; Communication Systems and Computer Software; Diversity Management; Downsizing, Relocation and Transfer; Ethical and Legal Issues; General Industrial Relations; Industrial Relations Policies; Internationalization and Globalization; Management Techniques; Motivating Employees; Performance Appraisal; Staffing and Training. For each citation she provided an abstract and indicated under what subjects it was cross referenced in her two lists. She also starred items to be found in the Briggs Library on the UMM campus. Ms. Gruys plans to use her project as a springboard for her doctoral thesis in Industrial Relations.

Mara Rutten's history project was probably the most ambitious of the three projects but provided the least empirical resources for faculty. Her project had two components: first, she carried out interviews with students and history faculty members to gauge their reactions to the climate for women students within the discipline; second, she examined fifteen course syllabi representing a wide variety of courses taught between 1991 and 1994 from all current professors and one previous professor to determine the frequency with which students were assigned to read books by or about women.

As a result of the student interviews, Ms. Rutten determined that men and women received unequal treatment in the history classroom: male students were called on more than female students and more often were asked to expound on their ideas; women tended to be given less precise feedback concerning tests and assignments. With regard to the course syllabi that she collected, there were approximately eighty books assigned to be read by students in those courses. Of these eighty books, only eight were either by or about women. Of these eight books assigned, all were assigned by only three of the seven history professors. Through her research, Ms. Rutten discovered that there were approximately 734 books in the Briggs Library by or about women in history. Given that it is library policy to order those books requested by faculty members, Ms. Rutten concluded that, obviously, faculty knew that these books existed because they had ordered them. Finally, she compiled a list of fifty-seven books about women in history and twenty-nine books by women historians.

Ms. Rutten also noted the pervasiveness of what she termed certain "mythologies" regarding women's roles within the field of history, both as historians as well as subjects of study. For example, according to one such myth, men tended to be viewed as the norm from which women were treated as deviations. Even self-acknowleged "feminist" professors did little to contribute to their students' knowledge of women's contributions to history both as scholars and as participants. According to another myth, to include women meant that something more important had to be left out. The discipline seemed to convey to the students interviewed that women who enter the field of history must necessarily specialize in women's history. Ms. Rutten herself took special interest in military history, typically not a "women's" field.

FUTURE DIRECTIONS

We are now in the process of evaluating the three projects produced and using this information to plan a larger project which will include all disciplines on campus. Our participation in this AAUW Symposium will enable us to share our findings as well as to gather input, ideas and resources for further expansion of the pilot project. Comments so far indicate that the students involved in the research were very positive about its effect on them and faculty are very appreciative of our and the students' efforts.

We would like to develop a more coherent framework from which students could carry out future projects and procedural guidelines that will result in comparable results even when the projects are carried out by different people. With regard to the three projects in chemistry, history and industrial relations, we did not have much influence on the direction the students took in carrying out their research. Although the other two students who had decided to conduct their research independently invited us to attend their final presentations and gave us copies of their final projects, they did not meet the original goals of the project as we had envisioned them. None of the students interviewed faculty members in order to compile a list of gender-balanced examples to be used in the teaching of academic concepts. And only two of the projects (chemistry and history) addressed the issue of gender bias in textbooks and teaching examples at all.

The fact that Ms. Durham perceived no gender bias in the textbooks used to teach chemistry, for example, led us to question the process of evaluating this gender bias and to see the need to develop a working definition of gender bias as it applies to textbooks and teaching examples. For future projects, we propose the following definition: the systematic exclusion or subordination of women and/or the relegation of women to stereotypical or demeaning gender roles. A definition of this type could also be extended to reveal racial or ethnic biases as well.

We would also like to develop a more systematic way to disseminate the information gathered both to campus colleagues and also to other campus communities. At the present time we have made the results of the students' projects available to the Commission on Women, The Women's Resource Center and the professors in the specific discipline studied. We also plan to make the results available to the UMM library and to the Faculty Center for Learning and Teaching. We have not yet tracked whether or not the resources are being utilized to enrich course content or to acquire new textbooks and/or reading lists.

Ideally, there should be several projects being carried out at the same time. One way to accomplish this would be to discover a more on-going source of funding or at least a larger source of funding so that we could conduct a number of these projects simultaneously throughout the campus.

Another way might be to include other institutions in this project. One of our next steps will be to contact other organizations that may be able to assist us with this endeavor. Such organizations might include the Wellesley College Center for Research on Women, the Journal of Women and Minorities in Science and Engineering, the Women's Studies Librarian at the University of Wisconsin and the Center for Advanced Feminist Studies at the University of Minnesota. A great deal of data documenting gender inequity in our educational practices is already available. A synopsis of this information should accompany the resource materials of future research projects to provide a unifying phase for the entire undertaking.

We are not aware of other groups or individuals which are conducting this type of research. While there do exist some comprehensive collections, we have not yet found any collection that breaks down the information about women's contributions according to discipline. We believe that such a comprehensive breakdown is essential in making the information easily accessible to faculty.

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FACULTY GOVERNANCE: A VEHICLE FOR THE DEVELOPMENT OF INSTITUTIONAL EMPOWERMENT STRATEGIES

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Title VII of the Civil Rights Act of 1964 and the Equal Pay Act of 1972 provide for the legal implementation of equality and prohibit gender based discrimination in employment decisions, including hiring and promotion. These two pieces of legislation were designed, in part, to promote the advancement of women including the female professoriate relative to pay and rank.

While decades old legislation prohibits gender discrimination in the workplace, such discrimination continues. State and federal government and the courts have dealt frequently with gender inequity in the business world has well as the military, but have been slow to remedy similar inequities in higher education. Gray (1993) presents the hypothesis that because courts tend to identify strongly with the decision makers in universities (the administration), they question the evidence of discrimination, statistical or otherwise. It could also be hypothesized that the reluctance of the judicial system to address gender discrimination within colleges and universities is related to the complicated and subjective nature of the tenure and promotion system, and the relative difficulty of comparing faculty members in regard to salary and rank.

Despite the difficulties involved in dealing with gender equity on a university campus, in the fall of 1993 a faculty senate ad hoc committee at a state supported university in the midwest was formed for that purpose. In addition to anecdotal reports on gender inequity in salaries and promotion across the campus, a national accreditation team noted in their 1991 report that over the period of a decade little progress had been made in increasing the number and percentage of women in the upper academic ranks. A further indication of possible gender inequity were salary data the university is required to send annually to state and national organizations.

The objectives of the following report are: 1) to describe two phases of a gender equity study that was conducted at a midwestern state supported university in 1993-94. 2) to describe how a faculty governance structure can be used to promote gender equity within an institution.

The initial research was conducted in the 1993 fall semester using data supplied by the central administration. The ad hoc committee decided to use as a benchmark a 1972 study of gender equity (1971 data) that was conducted by an earlier ad hoc committee (Fox, Bagnall, Eckman, Foy and Merriam, 1972). Results of the earlier study revealed serious gender inequities in hiring, salary, tenure and promotion. Following that study a charge of gender inequity was filed in 1972 with the Secretary of Health, Education and

Welfare. Subsequently, the central administration made salary adjustments for 61 male and 56 female faculty.

Study: Phase One, Rank

For Phase I of the 1993 study, descriptive statistics were utilized. This provided the ad hoc committee with a means of comparing 1972 and 1993 data to analyze any changes which may have taken place over twenty-two years.

Between 1971 and 1993 the number of female faculty at all ranks at the university increased by a total of 67, from 129 to 196, while the number of male faculty at all ranks declined from 562 to 484. This increase seems to suggest that the university made progress in achieving gender equity. The data reveal that at the end of twenty-two years almost sixty percent of female faculty were still clustered in the lowest ranks. Surprisingly, in 1993 more than seventy-five percent of all male faculty were clustered in the two top ranks of associate and full professor; an increase from 1972.

An examination of only tenured and tenure track faculty (assistant, associate and full professor) revealed that the number of female faculty more than doubled from 1971 to 1993. In that same period the number of tenured or tenure track male faculty decreased. In spite of the increase in female faculty, when rank was examined it was clear that there were still serious gender inequities, particularly at the full professor rank (see Table I).

Table I
Faculty at the Rank of Professor

	1971		1993		Gain or Loss from 1971-1993	
	N	%	N	%	N	%
Male	133	28*	210	46*	(+) 77	(+) 18
Female	14	18*	22	14*	(+) 8	(-) 4
	147		232			

*Percentages were calculated using the total of all tenured and tenure track male and female faculty at the assistant, associate and professor ranks combined (Males: 1971 = 475; 1993 = 459) (Females: 1971 = 77; 1993 = 156)

Overall, the number of males at the rank of full professor grew by eighteen percent between 1971 and 1993. Seventy-seven more males held the rank of full professor in 1993 than in 1971, in spite of an overall decrease in number of tenured or tenure track male faculty employed by the university. In the same period of time female faculty lost ground. In spite of the overall increase in female faculty and growth in female tenured and tenure track positions, there was an increase of only eight female full professors between 1971 and 1993, a four percentage point decrease. The glass ceiling that has been in place at the university may have moved up slightly since 1971;

however, the ceiling is still in place. It has successfully blocked promotion to the rank of full professor for all but a small number of female faculty on the university campus.

Salary

Salary was also examined for all colleges and departments by gender. Although salaries may vary from one department to another, results in Phase I indicate that large differentials related to gender existed within the same academic discipline.

Results of t-tests revealed that salary means differed significantly at the full, associate and assistant professor rank. The salary differentials ranged from $7,577 at the rank of full professor to $2,298 at the associate rank. At the assistant rank female faculty earned on average $4,565 less than males in 1993. At the instructor rank there was a mean difference of $657. Comparisons could not be made for lecturers as there were no males at this rank.

Differences in salary based on gender were significant for faculty holding the doctorate, master's, and professional degree. When highest degree was considered, the largest gender discrepancies in salary existed for women faculty with a doctorate. They earned $11,693 less on average than men with doctorates.

There were also large salary discrepancies among male and female faculty with many years of service. With 19 to 21 years of service women earned $11,115 less on average than men, and with 22 years of service the average is further reduced to $10,746.

Phase II-Multiple Regression

Although results of Phase I of this study provided strong evidence of gender inequity, the study was criticized because it lacked the power of control that a multiple regression analysis provides.

The method selected for the regression reported here is one that has been used widely (Gray, 1990). With this methodology, a regression model for male faculty members is obtained and the male-only equation is used to predict the salaries of female faculty. The residuals indicate the differences between males and females with the same qualifications. Other statistical techniques used were an ordered probit model to determine whether the promotion process is gender-related and an Oaxaca (1973) decomposition was also used as a means of measuring discrimination.

Independent variables included in the analysis were: rank, years in rank, years at the university, highest degree, years since the highest degree was obtained, college, department, and age. Salary was the dependent variable. To adjust for faculty with twelve month contracts, stipends were subtracted from salaries. Since a minimum number of males per discipline are required for regression (n=15) some disciplines were combined. Prior to grouping academic units that appeared to have market similarities, college deans and faculty were consulted.

Results of the multiple regression with the variable rank included indicate that women earn $369.54 less on average then men at the university, and fifty-two percent of the female faculty are negatively affected (see Table 2).

Although results of the regression with rank included are not statistically significant, the ordered probit model revealed the coefficient on gender was statistically significant and suggests that males are more likely to be in higher ranks than are females.

Table 2
Average Salary Differences Between Males and Females

Ave. Difference With Rank	%Females With Neg. Value	Ave. Difference Without Rank	%Females With Neg. Value
-$369.54 (5998.39)*	52	-$2807.82 (7710.21)*	67

*The standard deviations should be viewed with some caution.

A second regression in which the variable rank was excluded was also done, and the percentage of female faculty negatively affected increased to sixty-seven percent. With rank excluded the salary difference for female faculty increased to $2,897.82 on average, and was statistically significant (see Table 2).

In addition, a regression model based on female salaries was developed and used to predict male salaries. Results of this analysis indicated that ninety-eight percent of all male faculty earned higher salaries than females and suggests that the factors which increase salaries are more valuable for males than for females.

Results of the two phases of the study support each other and indicate that significant salary and promotion inequities still exist for female faculty at the university. Although more women faculty are being hired, overall, gender inequity has changed little in twenty-two years.

Following completion of phases one and two of its year-long study, the faculty senate ad hoc committee submitted several proposals to the faculty senate. Items included in those proposals corresponded with both issues related to the research process and results of statistical analysis.

Study: Phase One

A resolution was submitted and subsequently approved by the faculty senate after completion of Phase One. It called for the following actions by the central administration and the board of trustees;

- the establishment of a permanent senate committee on gender equity responsible for collecting and reporting data on the professional and economic status of female faculty,

- the designation by the central administration of a specific individual responsible for the annual collection and maintenance of the following faculty data: workload, salary, years at the institution, rank, years in rank, degree status, employment status, and other data deemed necessary by the senate committee on gender equity,

- a salary adjustment for all female faculty to the median or mean of salaries of male colleagues with the same rank and in the same department,

- the annual distribution of a written report on the economic and professional status of female faculty prepared by the senate committee on gender equity and distributed to the university community, the central administration, and the board of trustees.

The faculty senate ad hoc committee called for the establishment of a permanent senate committee on gender equity to monitor disparities in salary and promotion. It specified variables for data collection and a process for the collection and maintenance of data after learning that certain data was not collected, receiving ambiguous data from the central administration, and that data was not maintained in a central location. The senate ad hoc committee recommended distribution of an annual report on the economic and professional status of female faculty after it learned that no studies examining those variables had been completed in 22 years.

Study: Phase Two and Three

After completion of phases two and three of its report, the senate ad hoc committee called for the following action by the central administration and the board of trustees;

- maintenance of promotion data including the number of males and females applying, the number granted or denied tenure and promotion,

- oral and written advisory statements by the university president, the vice president for academic affairs, college deans, and department chairs of the disparity in rates of promotion between males and females,

- a review of departmental merit policies and procedures to eliminate those which are not quantifiable thereby reducing subjective merit reviews and hedging against gender bias in the merit review process.

The senate ad hoc committee made two recommendations on promotion when it found there was greater probability of higher rank for males than females. It made the recommendation on merit because some male and female faculty commented orally or in writing that merit procedures in their departments were subjective.

The faculty senate approved several other remedies designed to examine or correct barriers for female faculty. For example, the senate's faculty welfare committee called for university-wide training on gender issues. The senate's amendments and by-laws committee designed and submitted the membership and functions of the permanent committee on gender equity. In total, over the course of nine months, the faculty senate approved and forwarded the following to the central administration and the board of trustees;

- a resolution on female faculty status
- a permanent gender equity committee
- a resolution on gender sensitivity (to permit university-wide training on gender issues)

Finally, the chair of the faculty senate established another ad hoc committee to examine promotion policies and procedures across the university.

While change takes time, permanent change is achieved when institutions incorporate specific recommendations for change in governance documents and internal procedures. The faculty senate has attempted to improve the professional and economic futures for female faculty by doing just that.

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FOSTERING A WOMAN-FRIENDLY CAMPUS THROUGH AN INNOVATIVE ACADEMIC AND NON-ACADEMIC LIVING ENVIRONMENT

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Introduction:

At many large American universities, students are sensing a lack of community, confusion about values, a lack of intimate friends, tenuous personal worth, and reduced opportunities for positive student-faculty interactions (Whiteley & Yokota, 1988; Hart, 1991; Pascarella & Terenzini, 1991). The climate of any university exerts a powerful influence on new students (Banning, 1978). Upcraft (1985) suggests several environmental conditions that have positive effects on student success, particularly for entering freshmen: high interaction among students, strong faculty-student contact, availability of on-campus housing, and opportunities for extra-curricular involvement. Opportunities to promote personal growth and development, and a support structure of necessary resources may also be essential to student success (Blocher, 1978).

It is well documented that students who live on campus have significantly higher persistence rates (Gardner, 1991). As institutions become more student-centered, retention is enhanced. Educators who work in residence hall systems know there is substantial evidence that first-year students who live in residence halls are more likely to succeed than those who live elsewhere (Astin, 1973). New students, particularly women students, who enter the university unfamiliar with academic requirements, university regulations, available programs and services, etc. may increase their potential for a successful university experience by participating in an on-campus residential living experience.

In exit interviews with discontinuing students, researchers and administrators have discovered that the decision to drop out of college occurs most frequently during the student's first semester at a college or university (Lay & Winters, 1993). Although students might wait a few months or years to actually leave, his/her initial decision was made within weeks, if not days, after the student began college (Lay & Winters, 1993).

In the desire to create an atmosphere to support its education mission, to encourage intellectual, social, and personal success for its incoming freshman students, and to decrease what has become an increasingly longer time from start to finish of degree programs, Brigham Young University (BYU) introduced the SHINE (Student Housing Initiative in Education) program. This paper analyzes the impact of the SHINE program on entering freshman women students.

The SHINE Program

Starting with the fall semester 1993, BYU initiated a pilot program (SHINE) to study the effect of an integrated academic, non-academic living environment on freshman student success. Two residence halls, one men's and one women's, were designated as "residence-centered learning communities." Students living in these halls were enrolled as groups in selected general education classes to facilitate studying and learning together as part of their living experience. Classes were specifically designed to allow for more access to and personal interaction between faculty who volunteered to teach SHINE classes, and the students. Teachers had agreed to eat at least one meal each week throughout the semester in the residence halls. Teaching assistants assigned to the SHINE classes were to be available in the residence halls during evening hours.

The program also helped students focus on scheduling general education and major courses, thus decreasing unnecessary overlay or confusion in planning coursework. According to Ted Hindmarsh, Student Auxiliary Services communication and academic administrator, "We want to determine if this type of learning environment will help students more quickly adjust to the university and provide a support system. By mentoring, orienting, instructing, counseling, and caring for students as members of a small community, the program will make it harder for students to 'fall through the cracks'." (Lay & Winters, 1993, p. 1.)

Methodology:

The SHINE students (114 women, 114 men) were randomly selected from students who had been accepted to live in on-campus residence halls and had applied for the SHINE program. Ages ranged from 16 - 19 years. Although women and men students were housed separately in adjacent halls, they ate together in the same dining area. The three general education classes in which SHINE students were enrolled together provided a common core of eight credits. They chose other classes based on their individual majors and interests, although they were guided toward specific sections of popular courses recommended by SHINE administrators. As a result, part of the group shared more than three courses in common. Students were encouraged to study together and teachers ate at least one meal per week with the students.

Questionnaires which were sent to all members of the returning freshman class (including SHINE students) asked students to express satisfaction with various aspects of their freshman experience. To facilitate analysis, freshman students were divided into four groups based on their living arrangements from the prior fall: (1) living on campus as members of the SHINE community, (2) living in other campus housing, (3) living off campus, and (4) living with relatives. Data for each group were analyzed using frequency tables, ANOVA, and Duncan's Multiple Range Tests. All analyses were run twice: (1) for all freshman (male and female) returning questionnaires, and (2) for all female freshman students who returned questionnaires. Focus groups were also conducted during Fall Semester 1993 with representatives from each of the four housing groups. This report will concentrate on the impact of the SHINE experience for the female students, although other comparisons will be made where appropriate.

Results and Implications:

Female SHINE students had significantly lower high school GPA's ($p = 0.002$), and slightly lower ACT scores and freshman GPA's than the average member of the freshman class. However, when asked after completing their freshman year about their perceptions of themselves, SHINE women ranked their intelligence as equal to or higher than their classmates, and were most satisfied and happy with themselves.

As a rule, students living on campus were generally more pleased with their housing arrangements than those living off campus or with relatives. Nearly all students participating in the focus groups found their living accommodations to be at least acceptable, and the physical quality of their living quarters did not appear to be much of a factor in how pleased the students were with their experience at BYU. However, SHINE women responded most positively when asked if they were pleased with their living conditions ($p = 0.04$). When asked about services provided as part of their housing arrangements, 88% were either satisfied or very satisfied with on-campus housing services as a whole and 86% were satisfied or very satisfied with services provided by their residence hall. Although SHINE living quarters were essentially no different than those of other groups living on campus, the nature of the SHINE experience, coupled with SHINE cohesiveness and friendships, helped SHINE women feel safer and more secure on campus than did women in other housing groups ($p = < 0.001$).

SHINE women were more positive than other freshman women about the university climate in general ($p = < 0.001$). They felt they could make a greater contribution to university policies ($p = 0.05$), felt more positively about university facilities such as the bookstore ($p = 0.002$) and those offered for athletic activity ($p = 0.02$), and even felt more positively about one of the traditionally frustrating campus hangouts - the testing center ($p = 0.03$). SHINE women felt more included in campus activities than other groups ($p = < 0.001$) and recognized greater opportunities to involve themselves in these activities ($p = 0.001$).

SHINE women were most positive about the ease with which they were able to make new friends ($p = < 0.001$), and indicated that they had made a lot of new friends on campus. As a comparison, SHINE women reported having made over half again as many close friends as freshman women students living at home or with relatives. One SHINE student reported that "My boyfriend (not a SHINE member, but who has been on campus longer) is constantly amazed at the number of students I know, and who greet me, as I walk across campus." The larger number of friendships the SHINE women describe helped them to "connect with the campus." Although residence halls at BYU are not coeducational, these connections extended to both male and female friends. SHINE students (along with other on-campus freshman women) reported a significantly more active social life than those students living off campus or at home ($p = < 0.001$). SHINE women felt more included in campus activities than other groups ($p = < 0.001$) and recognized greater opportunities to involve themselves in these activities ($p = 0.001$). It appears that their association with other SHINE students provided a large group of friends from which to launch out into other friendships, that things had been "easier" for them than for other students as they made the transition from high school to the university environment.

All students were quick to acknowledge that BYU was harder than high school. SHINE students were no exception. The usual freshman complaints about large classes and disinterested teachers, of difficult assignments and "no one caring", came from SHINE and non-SHINE women alike. Learning how to study and knowing where to turn for help on campus were universal problems. However, the SHINE experience of taking classes together with a group of residence hall mates was seen as a great advantage. In general, they were very positive about their classroom experiences, significantly more so than the other groups ($p = 0.004$). They were also more appreciative of the size of their classes ($p = 0.08$). SHINE women appeared to be clearly invested in the welfare of other SHINE members. Several SHINE students remembered being awakened by other SHINE roommates or friends when in danger of oversleeping, or being encouraged to be more diligent after missing classes. While these kinds of activities are probably common to all college groups, the SHINE women were most likely to mention them as a memorable part of their university experience.

SHINE women were more likely to study longer hours ($p = < 0.001$), less likely to study alone, and more likely to participate in study groups ($p = < 0.001$). They reported that it seemed "natural to study together" and had the least difficulty getting into study groups ($p = < 0.001$). SHINE women actually studied significantly more hours per week than did freshman women in the other groups, averaging 15 - 20 hours per week during the fall semester and approximately 20 hours per week during the winter semester. They also had a somewhat higher opinion of their study skills than did the other groups. Along with studying more hours, they worked significantly less at part-time employment, both on campus ($p = 0.01$) and off campus ($p = < 0.001$).

On the down side, the greater friendliness of the SHINE group tended to make their residence hall an even more social place than usual and less conducive to studying. However, some of the SHINE students partially solved the problem by agreeing among themselves to be quiet during afternoon hours to facilitate study. Professors claimed SHINE classes were also noisier than average, and in some cases they needed to tone down the greater "friendliness" during class time.

In contrast, female students living at home were least positive about their University experiences. These women worked long hours at both on and off campus jobs, tended to study alone, had more difficulty making new university friends, and sought out high school relationships for social experiences. Although their GPA's were higher at the end of their freshman year than the GPA's of the SHINE women, they had a somewhat lower opinion of their own intelligence and were somewhat less happy with themselves. They were least likely to feel that the university had much concern for them as individuals ($p = 0.05$), less likely to feel that their professors cared about them, and less likely to feel that they were successful students. Freshman women living at home enjoyed their first year experience at BYU the least of any of the four groups surveyed ($p = < 0.001$).

SHINE women found their first year at BYU to be more enjoyable than did any of the other housing groups ($p = < 0.001$). Although their average GPA was not as high as other groups, they were somewhat more likely to view themselves as successful students and to come to feel that their instructors cared about them as individuals. Comments from the focus groups also indicated that the SHINE women appeared to be the most optimistic about eventually graduating from the university.

It appears that the SHINE program was successful in creating a sense of community for freshman women and helping to elicit positive perceptions of their freshman year experience. The SHINE learning environment apparently helped students adjust more quickly to the university, developed a support system for them, and provided them with the essential attention so necessary during the critical first year of the university experience. Brigham Young University leaders, with the strong support of SHINE administrators and students, have doubled the size of the program for the 1994-1995 school year, and anticipate doubling it again the year after that. Although there have been some minor difficulties, future freshmen students at BYU can anticipate a more student-friendly campus experience with the growth of the SHINE program.

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SMART Girls for the 21st Century

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"I really hate math and I don't like computer games. The boys always beat me so that's no fair or fun." "In science, boys do the experiments and all I get to do is write." How many teachers hear comments like these every day? What can educators do to encourage girls to be more confident in school settings? Can educators be part of the solution in producing "SMART Girls for the 21st Century"? This paper describes a SMART (Science, Math and Related Technology) program that was initiated to direct teachers in becoming more effective in providing gender equity classrooms. The effort features a collaborative approach between a Girls Incorporated facility and a women's college teacher education program.

Existence and persistence of the problem

Our schools make it hard for girls to achieve and be self-confident from grade school to graduate school. A growing number of studies provide evidence that girls make negative assumptions regarding their academic skills and abilities. They get information from parents, teachers, and fellow students confirming their negative feelings regarding their competences. Stereotypes regarding females have been passed down from generation to generation and girls and women have responded to these "self-fulfilling prophecies." These behaviors have resulted in a "gender gap" that must be altered in the 21st century. David Shipp forecasts that if "present trends continue, more than 2,000 years will pass before women receive as many math doctorates annually as men do" (Shipp, 1992). This is just one curricular area and illustration of the waste of resources that this produces for the United States and the world.

Where do these stereotypes come from? They are easily seen in varied interactions with girls and women. Given advertising, girls and women are often shown as poor problem solvers who defer to men and boys to make decisions. Although some changes have occurred, math textbooks continue to omit girls and women in demonstrating math story problems and literature depicts girls and women as bystanders in action-filled stories. A Barbie doll that stated "I hate math" promoted this stereotype of women. Extensive action by women was needed before the doll was removed from the market. In classrooms that conduct research on how teachers depict scientists, findings continue to show that inservice and preservice teachers believe scientists are "intelligent, inquisitive, and curious males" (Carlson, unpublished study). Although Naisbitt and Aburdene predicted a breakthrough decade when women would achieve positions of leadership, "women have not been aware of this, nor have they known which career paths lead upward as opposed to those which dead-end" (McGrath, p. 62). Demographics show that by the 21st century, women will comprise at least 47 percent of the labor force. Given impressions of deference, how can they be expected to lead?

Teacher behaviors and classrooms

Numerous studies show that gender bias is particularly evident in classrooms. Subtle and not-so-subtle practices are evident every day. Myra and David Sadker's research shows that male students get more attention and are given more time to talk in classrooms even if the emitted behaviors of boys are aggressive and inappropriate (Sadker and Sadker, 1991,pp. 465-467). They believe that the most valuable resource in the classroom is the teacher's attention. The Sadkers found that boys call out responses which are acknowledged and girls are required to raise their hands. In directing learning, teachers encourage boys to work harder to problem solve while girls are provided direct assistance in securing answers. This implies that girls are unable to solve the assigned problems.

Research shows that female students in U.S. schools start out ahead - in reading, in writing, and even in math - and 12 years later they are behind males in these academic areas. Biased classrooms exist and inhibit student achievement.

Description of program

The SMART program was initiated to address problems that young girls experience within classrooms and to create teacher training that would address gender equity. In 1992, Girls Incorporated of Omaha and College of Saint Mary initiated a joint program that focused on teacher preparation and science and math instruction for second, third and fourth grade girls. The dual approach emphasizes gender equity instruction for teachers and offers hands on experiences in science, math and technology for young girls. The program extended the focus of the 1985 SMART national project which encouraged girls to persist in science and math studies. Funded by U.S. West and Honda Foundations, this program demonstrates positive interrelationships and collaboration by business, a college and a local organization.

At the College of Saint Mary, both graduate and undergraduate students are enrolled in the program. All elementary and middle school preservice teachers are involved in after-school SMART activities during fall and spring semesters. Graduate level teachers participate in a four week summer program. Teachers and preservice teachers are engaged in experiences in developing math and science curriculum and directing learning activities for multicultural students. The SMART program ensures that teachers will become more confident as they prepare and implement instructional hands on materials that are thematically selected and developed. Given encouragement, the teachers integrate math and science activities with other curricular areas, such as language arts and social studies.

Approximately 40 members of Girls Incorporated of Omaha come to the college campus for two evenings a week and for four weeks during the summer. These second, third, and fourth grade girls participate in science, math and computer activities. Two liaisons from Girls Incorporated of Omaha accompany the girls to the college and assist in implementing the program. Each of the Girls Incorporated participants receive parental permission to attend the program. Transportation to the college and some scholarships for membership in Girls Incorporated are provided through grant funding.

Project Introduction

The major purpose of the project is to provide a preservice and graduate level program which enables teachers to design and direct scientific and math experiences for elementary aged students which feature hands-on experiences resulting in increases in knowledge, skills, and values. These teachers receive extensive training in gender and multicultural equity. The expected outcome of the program is to enhance teachers' confidence and awareness of effective approaches for providing math and science activities in equitable classrooms.

As a result of involvement in the selected SMART experiences, it is anticipated that the 2nd, 3rd and 4th grade participants will demonstrate progress in gaining math and science knowledge, skills and values and will exhibit positive perceptions towards math and science. The outcomes of the project are measured through surveys and interview instruments.

Methods

Teachers

Preservice and inservice teachers receive questionnaires to rate their levels of confidence in teaching math and science, teaching in gender and multiculturally equitable classrooms, understanding math and science concepts, planning hands on activities and using effective questioning techniques. They also rate their confidence levels in teaching specific math skills and science topics. All items provide for open-ended comments and quantitative judgments. The surveys have remained the same throughout the study except for an addition of a rating scale of science processes in 1994. Surveys are administered to graduate level teachers at the beginning and end of the four week summer session. These teachers also respond to a follow-up questionnaire at a breakfast gathering in December. Surveys are administered to preservice teachers three times during the academic year, at the beginning and end of fall semester and at the end of spring semesters. The preservice teachers complete additional questionnaires which provide comparative results across semesters.

Girls Incorporated Participants

During each session, participants from Girls Incorporated of Omaha are administered surveys which measure their attitudes toward various subjects. They also respond to items regarding their knowledge of skills and topics in math and science and their judgments of math and science difficulty. The surveys are administered to the girls each semester of attendance in order to secure comparative data for students attending multiple sessions. In order to add a qualitative component to the study, an interview protocol was developed and used with girls who attended several sessions. Questions posed required students to describe and compare their math and science experiences in SMART and in school, to discuss general beliefs about men, women and careers, to address equitable treatment of girls and boys in classrooms, and to make evaluative statements about their SMART experiences.

Limitations

The data from Girls Incorporated participants are limited by inconsistent attendance of 2nd, 3rd and 4th grade girls during each semester. This data is being re-categorized in order to compare girls with regular attendance to those with sporadic attendance. It was anticipated at the beginning of this project that long-range comparisons of girls attending the program could be secured. The results, however, are limited by the small number of girls who have consistently attended the program over multiple sessions. Control group data are also being collected from comparative samples of girls who have not participated in the SMART program.

Findings

Preservice Teachers

During each academic year, undergraduate education preservice teachers complete questionnaires during fall and spring semesters. These students are enrolled in Science and Math methods courses and teach in the SMART program both semesters. Comparisons in their confidence ratings should indicate change resulting from their learning course content and from their directed experiences in teaching science and math to 2nd, 3rd and 4th grade girls. The rating scale on the questionnaires ranges from 1 (very unconfident) to 7 (very confident). During the 1992-1993 academic year, students' confidence ratings increased in all areas. Increases of at least one interval on the seven-point scale occurred in six of the eight categories: teaching math, teaching science, planning for multicultural equity, understanding math concepts, understanding science concepts and teaching with hands-on methods. These increases in confidence ranged from 21.2% in multicultural equity to 45.0% in teaching science. Confidence levels in teaching science increased nearly two intervals (1.8). Confidence levels in planning for gender equity and using questioning skills increased 9.0% and 15.0% respectively. These areas were rated at moderately high levels during the fall assessment with students indicating that they were "a little confident" at that time. This would affect the smaller increase.

During the 1993-1994 academic year, preservice teachers' confidence ratings increased in all areas. Increases of at least one interval occurred in six of the eight categories. These increases in confidence levels ranged from 20.8% to 32.6%. The two remaining areas, understanding math concepts and using questioning skills, increased

18.8% and 13.7% respectively. Data from the 1994-1995 academic year is currently being compiled.

The results show that these preservice teachers are improving their confidence in teaching math and science and they feel more secure in planning gender and multicultural equity classrooms. Student comments on the questionnaires support these findings:

> "I have felt very confident and now I feel extremely confident being exposed to this class. I feel very strong about equality issues with gender."
>
> "I feel that through my own interest in the subject and the instruction I received in education classes I have become more confident and realized the importance of educating males and females equally."
>
> "Math is not my strong point, but I feel I could effectively teach it with hands-on projects and an understanding of math processes.. I learned more about teaching math in lab than I remember learning throughout my own schooling."
>
> "I think that I feel more confident because we were taught how to ask questions appropriately and what types of question to ask" (higher vs. lower level questions, etc.).

Graduate Level Teachers

During the four-week summer session, graduate level teachers complete two confidence rating scales as pretests and post-tests that measure attitudinal change. The summer program includedcertified teachers who were seeking additional training or recertification.

Confidence ratings in summer 1993 increased in all eight areas from pretests to post-tests. Three areas showed improvement in confidence of over two scaled intervals which provided a 60.5% confidence increase in teaching using hands-on methods, 66.7% confidence increase in understanding science concepts and a 65.8% increase in teaching science. The increases in the remaining areas ranged from 31.8% to 41.5%. Students initial ratings were generally at the midpoint with these teachers indicating that they felt "okay" (4.0), "a little confident (5.0) or a little unconfident (3.0)". However, their final ratings ranged from "a little confident (5.0) to very confident" (6.0).

During summer 1994, teachers confidence ratings increased in all eight areas. Ratings in four of the eight areas increased at least one interval ranging from 19.2% in understanding science concepts, 21.0% in teaching science, 20.0% in planning for multicultural equity to 24.0% in teaching using hands-on methods. The remaining areas showed confidence level increases ranging from 7.0% to 19.2%. The initial ratings of the graduate students in this session ranged from "a little confident" (5.0) to nearly "very confident" (6.0) while their final ratings ranged from "very confident" (6.0) to almost the "extremely confident" (7.0) level. While these teachers started with moderately high ratings, the results indicate that there was significant improvement in their levels of confidence. Their comments support these findings:

> "I am feeling a renewed sense of confidence in my ability to develop hands on math activities which relate to how we use math in our daily lives."
>
> "I am much much more comfortable with science concepts. It's not so scary anymore."
>
> "I feel better everyday because the SMART program has enriched my confidence."
>
> "Girls have great ideas to contribute to discussions. They too, understand math and science and enjoy them."
>
> "I have learned many more ways to teach math. I feel much more confident about teaching science because of this class.

Girls Incorporated Participants

Attitudinal Survey

A major outcome of the SMART program is to assist girls in maintaining positive attitudes toward math and science that are present during primary years. Given questionnaires, students rate their feelings about studying math and science and other subjects. Seven-point Likert scales were used to assess attitudes and subject difficuly. The range of attitudinal responses toward math and science include "I love it (7.0) to I hate it" (1.0). Responses regarding subject difficulty range from "extremely easy" (7.0) to "extremely hard" (1.0).

During the fall 1993 semester, 2nd and 3rd graders surveyed indicated positive attitudes toward both math and science with average ratings of "I really like it" or "I like it a little" (5.6). Their judgments of math and science difficulty ranked between the categories of "very easy" and " a little easy" (5.6; 5.75). The 4th grade girls' attitudes toward math were between "I really like it" and "I like it a little" (5.5) while science rated slightly less positive at "I like it a little" (4.8). Math difficulty was rated at "a little easy" (5.0) and science difficulty as between "very easy" and "a little easy" (5.5). Overall, student ratings of these variables were positive, however, 4th graders were slightly less positive than 3rd graders in their attitudes toward science. Fourth graders also viewed math as somewhat more difficult than 3rd grade students.

During the spring 1994 survey, student attitudes toward studying math were generally positive ranging between "I really like it" and "I like it a little". Second grade students rankings were highest (6.2) followed by 4th graders' ratings (6.0). Third graders' ratings were slightly lower (5.45).

Student attitudes toward studying science indicated that 2nd grade students had more positive attitudes towards science (5.63) than 3rd and 4th graders (4.8 and 4.7 respectively). The ratings ranged from "it's okay" to "I really like it". Interestingly, science attitude ratings were slightly lower overall than math attitudes for all grades.

Student ratings of subject difficulty appeared closely linked to their general attitudes. While all student ratings ranged from "okay, a little easy, very easy or extremely easy", there were group differences Third grade students rated math as more difficult than either 2nd or 4th graders. This seems to correspond with their relatively less positive attitudes toward math. Similarly, 4th grade students found science most difficult of the three groups and their science attitude scores were less positive than 2nd or 3rd grade students.

Group Comparisons

A preliminary examination comparing students entering the SMART program for the first time with experienced SMART program participants indicated that although all 3rd graders rated math similarly, experienced students rated science more positively. Experienced 3rd graders and new 3rd graders gave similar positive ratings in three areas including attitudes towards both math and science ("I really like it") and science difficulty ("very easy"). However, experienced 3rd graders rated math as less difficult indicating that is was "very easy" versus new students' rating of slightly under "a little easy."

Fourth grade students rated science similarly, but experienced SMART students had more positive attitudes toward math. Experienced 4th graders varied significantly from new students in two areas. Both sets of students rated their attitudes toward math as "I like it a little" and rated math difficulty as between "a little easy" and "okay". The differences appeared in science measures which indicated that experienced students had more positive attitudes between "I love it and I really like it" in contrast tonew students' attitudes of "I like it a little." Experienced students also found science less difficult than the new students as seen in judgments between "extremely and very easy" versus those of "a little easy."

Apparently, students involved in the SMART program are able to at least maintain or improve their positive attitudes. Differences between students who had participated in

SMART and those just entering the program are evident . These differences may suggest that involvement in the program contributes to the maintenance or development of positive attitudes toward math and science in young girls. This analysis is in the preliminary stage.

Conclusions

It is apparent that the preservice and graduate level teachers included in this study improved their levels of confidence in teaching elementary math and science and in providing for gender and multicultural equity classrooms as a result of their experiences in the SMART program. These teachers continue to report that their involvement in the SMART program is affecting their attitudes and teaching behaviors. Comments on follow-up questionnaires and anecdotal reports support these findings:

> "My attitude toward 'here's' math was much more enthusiastic after being in SMART Lab. I have stopped cringing when I see 'MATH'."
>
> "Since I took the gender equity class in the summer of '92, I have been more aware of alternating boys and girls when I call on them, mixed groupings in cooperative group activities, tasks for the classroom, etc. This surprised me that the students paid such close attention to this but they do."
>
> "I use the manipulatives a lot with first grade. I'm buying and choosing the ones I worked with this summer. Manipulatives are a must ..."
>
> "I have done a unit using ideas from summer school. Again, I'm using lots of manipulative and attempting to combine math and science. At times we combine math and art or science and art."
>
> "I'm calling more on girls, especially in math and science, and having the girls set up for science experiments."
>
> "It has helped so much to use hands-on activities on a regular basis. That way every one is busy and getting a chance to participate. When I do cooperative learning activities, I put as many girls in charge as boys in small groups."

While changes in confidence levels indicate that "something" happened to the preservice and graduate level teachers involved in the SMART program, these comments show that they have taken that "something" with them to make changes in their instructional methods that will enliven their teaching and will result in them providing more equitable opportunities for girls and boys in classrooms. This is the true measure of this program. Directing teachers in selecting appropriate and exciting teachiing strategies andproviding multicultural and gender equity training with opportunities to "test" this learning by directly working with students is a model of teacher education that will make significant differences for both educators and students.

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Decision Making and the Female Faculty Member

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Introduction

A provocative question recently asked of presidents of post secondary institutions was "Should American universities be reinvented?" (Adamay, 1994; Greiner, 1994; Hackney, 1994; Lagemann, 1994; McCallum, 1994). This question results from new challenges facing institutions of higher learning. Within the academy, tensions have surfaced relating to issues of research productivity and the relative value placed on teaching and service. Added to this internal climate of unease are the pressures placed on post secondary institutions caused by the severe budget constraints of the 1990s.

Periods of retrenchment in higher education constitute difficult times for faculty, but can have a potentially devastating impact upon female faculty (Kerlin & Dunlap, 1993; Slaughter, 1993). As Slaughter's (1993) findings make clear, retrenchment in the academy can not be divorced from issues of gender. It can even be construed that budget cuts, within post secondary educational organizations which reduce or eliminate disproportionate numbers of female faculty positions "may be at least in part a product of what Faludi has described as a backlash within American society against many of the gains accomplished by women" (Kerlin & Dunlap, 1993, 740). This paper examines questions of female faculty decision making in relationship to the current climate of retrenchment and provides the conceptual framework of an ongoing qualitative investigation into women and decision making in higher education. What follows is an attempt to outline a method for examining the decision making of female faculty as it relates to teaching, service and research.

Gender and decision making in the Academy

The relationship of gender to decision making in the academy is an important one. When decision making is tied to issues of promotion and tenure the importance is magnified. It has been argued that although women have gained access to academe, many remain barred at the assistant and associate faculty levels due to the functioning of old norms in institutions of higher learning (Aisenberg & Harrington, 1988; Tack & Patitu, 1992; Tokarczyk & Fay, 1993). Bureaucratic means which appear neutral may serve to perpetuate the myth that the gender relationships which co-exist in bureaucratic life are non problematic. Institutionally, it is asserted that gender is irrelevant and that males and females are evaluated according to the same criteria (Blackmore, 1989). Such an emphasis on bureaucratic neutrality and rationality fails to consider female epistemology and decision making (Amey, 1992; Babbitt, 1993).

The differential status of women in higher education has been well researched and suggests that the majority of female professors are primarily relegated to adjunct positions and are granted tenure at lower rates than are male professors (Tack & Patitu, 1992; Tokarczyk & Fay). According to the Digest of Education Statistics (1993), there are 21,163 female full professors as compared to 123,173 male full professors. Such findings are consistent with an MLA study which reported that women are turned down for tenure at a far greater rate than male academics (Tokarczyk & Fay, 1993). These inequities contribute to a lack of diversity on campus and correspondingly result in an institutional imbalance.

Although, unarguably, academe has accepted the idea of female faculty, it may be hypothesized from findings related to female academics (Amey, 1992; Aisenberg & Harrington 1988; Tokarczyk & Fay, 1993) that it has not accepted women's ways of thinking or valuing (Amey, 1992; Belenky et al., 1986; Chodrow, 1978; Gilligan, 1982). Aisenberg and Harrington (1988) examined the question of why academic women were disproportionately denied tenure at northeastern colleges and universities. It was revealed that women in academe experience what they maintain constitutes "a professional marginality". Morawski (1994) suggests that although the concept of "liminality describes the situation of marginals"(53) by constituting a position of betwixt and between it can present an opportunity for transformation and replacement. It is in this spirit that gender and decision making in the academy will be explored.

The available research regarding women in decision making has implied that the decision making of women differs significantly from their male counterparts (Aisenberg & Harrington, 1988; Amey, 1992; Blackmore, 1989; Lyons, 1990) Women in academic positions maintain a group as opposed to individualistic orientation, and correspondingly they place a higher value on teaching and service than on scholarship (Aisenberg & Harrington, 1988; Amey, 1992; Tack & Patitu, 1992; Tokarczk & Fay, 1993). Within the traditional socialization of women in fields compatible with social service, (nursing, education, and health professions), female academics conceive of their work as community and group oriented (Tack & Patitu, 1992; Tokarczyk & Fay, 1993) and therefore, may not display the necessary individualistic or self interested motivation required for maintaining an active record of publication. Female academics may be "clustered in disciplines that are more likely to be oriented toward practice, with rewards that are not associated with research and scholarship" (Tack & Patitu, 1992. 36).

Different orientations towards teaching, research and service in connection with higher education's preservation of patriarchal norms may serve to relegate female academics to the bottom tier of the institution where they carry out the supportive roles of teacher, advisor, and committee member (Aisenberg & Harrington, 1988; Amey, 1992). Bateson's (1989) findings reported that female academics were called upon to engage in more service activities and had less time for individual scholarly pursuits. High degrees of service may actually harm the female professor in that universities "as a general rule have failed to develop effective mechanisms to recognize and reward faculty participation in service (McCallum, 1994 331). Institutional service demands, coupled with family responsibilities can potentially cripple the female professor in her pursuit of promotion and tenure (Baber & Allen, 1992; Tack & Patitu, 1992).

A Decision Making Framework

In the midst of these competing exigencies, the female faculty member's decision making is intricately related to her values, priorities and the efforts to make the "right" decision. Few decisions are made which actually balance costs and benefits (Beach, 1990, 1993; March, 1994). Decision makers possess three distinct, but related images, each comprising a particular component of decision related knowledge (Beach, 1990, 1993): (1) How events should proceed in light of the decision maker's morals and values? (2) The type of changes or objectives the decision maker seeks for herself or the organization and; (3) the implementation of the plans necessary for securing these goals and the projections of the effects of her efforts in light of the project's success or failure.

Within these three images of related decision knowledge, decision makers seek to make "right" decisions (Beach, 1993). "Right" decisions can either be made in the "right" way or they can yield the "right" results (Beach, 1993, 4). The first views the decision processes involved while the second seeks whether or not the decision produced the desired result. Beach's (1993) definitions fail to consider two crucial components, consideration of the perception of the decision maker and organization as to the "correctness" of the decision. The ambiguous environment in which decision making occurs is a key element.

A decision stems from two guesses concerning the environment..."One is a guess about how to classify the current situation. The other is a guess about what identity is relevant in such a situation and what it requires. In each case, one guess is about a reality external to the self and one is a guess about the self" (March, 1994, 180). This calls for the consideration of "the decision maker's subjective view of uncertainty as well as the objective features of her situation" (Sniezek & Buckley, 1993, 88). Subjective uncertainty can be defined as the decision maker's "personal perception of the degree of predictability in a situation"(Sniezek & Buckley, 1993, 88). This can vary from insufficient personal access to knowable complete information to a universal lack of information, or a combination of both (Sniezek & Buckley, 1993). When regarding complex organizations, such as colleges and universities in light of decisions relating to promotion and tenure, subjective uncertainty for the female faculty member is the result of both a lack of complete access to the information (It can be known, but I do not know) and a universal lack of information (No one can know).

The subjective uncertainty of the female faculty member is directly related to internal stressors, as identified by Tack and Patitu (1992), consisting of teaching, research, achievement and recognition for achievement. These factors can be combined with issues related to salary, tenure, academic rank, interpersonal relationships and working conditions. In a summary of findings related to women academics, Tack and Patitu (1992) noted the following:

> ...Women faculty believe they have no control over their working conditions... Women faculty also believe that they have to prove themselves over and over again before their colleagues can accept them and before they can achieve appropriate recognition (52).

Tack and Patitu (1992) conclude that further research needs to conducted to further examine the role of female faculty within the academy. Image theory (Beach, 1990, 1993) provides a model upon which to base an examination of the decision making of the female academic. Coupled with the examination of subjective uncertainty (Sneizek & Buckley, 1993), this framework holds a great deal of potential for in-depth analysis.

Conclusion

A framework for examining the decision making of women in academics is an attempt to provide one piece of the puzzle posed by the question "Should Universities reinvent themselves?" A potential answer is embedded in what DuBois et al. (1985) suggest lies at the heart of feminist scholarship, "the awareness of the problem of women's oppression and of the ways in which academic inquiry has subtly subsidized it, a sense of the possibilities for liberation, and a commitment to make scholarship work on women's behalf" (197). However, the female academic's marginal status or liminality within the academy should be viewed not solely as a condition whereby women are "stuck in or stuck by something" but rather can be seen as transformative. (Morawski, 1994 56). This transformative power is the result of new decisions being made regarding the role of teaching, research and service.

Institutions of higher education must come to accept different decision making strategies and must work to untangle the conflict between individual and organizational "right" decisions. This acceptance doesn't erode the traditional norms and mores of "the sacred grove" (Aisenberg & Harrington, 1988) rather it serves to reinforce the development of a new university mission. Greiner (1994), president of the University of Buffalo, maintains that it is possible for those in leadership positions to aid institutions of higher education to restructure and refocus by creating "means to reward new and broader kinds of teaching and scholarly activity" (321). Such a vision is possible, and indeed vitally important during these times of institutional retrenchment. There appears to be a strong connection between this newly evolving mission and women's decision making within the academy.

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School-College Action Research and Curriculum Intervention to Effect Change for Girls in Urban Middle-School Physical Education

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Abstract

The focus of the paper is the presentation of two action research studies and a model school-college strategy to effect change and gender equity for girls in urban, middle-school physical education. The action studies, conducted by school practitioners and college personnel, are part of a larger partnership project entitled Project SCOPE and part of a collaborative program engaged in by Queens College and the New York City Board of Education.(1) Started in 1980, Project SCOPE targets the school's curriculum, staff development program, and the college's teacher education programs and then integrates them to effect holistic change and improvement in k through twelve schooling and teacher education.(2) The two action research studies presented focus on a longitudinal analysis of health-related fitness performances (e.g., cardiovascular endurance) of adolescent students and a parent-teacher-student survey to identify the curriculum preferences and priorities of the school's population for an urban middle-school physical education program. Data were analyzed with reference to gender differences and health standards set by the medical and health professions. As part of an overall plan, curriculum intervention tactics and strategies were employed to effect change for girls in physical education.

Introduction

From past reviews of gender research and the recent *AAUW Report: How Schools Shortchange Girls*, we know that the inequities and gender-biased practices that exist in general education against girls severely hamper their academic achievement in school which, in turn, significantly affects their futures. The gender-biased practices that are found in general education are in many ways amplified in school physical education and athletics. Such unfair practices affect a girl's self-confidence, her health and knowledge about her body, her freedom of movement expression, and her right to participate in a wider range of physical activities (AAHPERD, 1992; Lenskyj, 1986; Lirgg, 1992). Perhaps of all the subjects of the school's curriculum, physical education, with its emphasis on the body, carries with it from past centuries intractable biased behaviors against girls and prejudicial Victorian attitudes that confine a female to a traditional role in society--a role that has negatively affected her opportunities to participate in physical activity.(3) Even after the passage of Title IX in 1972, which was to ensure equal opportunities for females and males in all education programs receiving federal funds, many physical education programs around the nation still have inequities with regard to facilities, scheduling, financial support, scholarships and opportunities for females to participate in sports (AAHPERD, 1992; Sadkers, 1994). And today, most unfortunately, we still have too many urban programs that continue to promote gender-role stereotyping in their class structure, instructional styles and selection of physical activities. For example, a large number of middle and high school urban programs still have classes of physical education that are separated according to sex. Boys are taught by male faculty and girls by female faculty. Course offerings of such programs usually revolve around "girls' activities" (e.g., aerobics, dance) and "boys' activities" (e.g., weight training, football). Instructional terminology such as "man-to-man" defense rather than "player-to-player" or "one-on-one" defense is frequently used by teachers of coed classes, where there are coeducational classes. And in large coed sport classes of 100 students, being assertive and aggressive in game play is expected of boys but subtly discouraged in girls.

You want to see girls shortchanged? Come to the gymnasium. Numerous studies, reviews and my own observations of programs (Catelli, 1990a, 1990b, 1992a, 1992b; Griffin, 1989; Vertinsky, 1992) have revealed the inequities and unfair practices that occur in physical education. For example, we know from research on coed physical education classes that teachers consistently give more attention to boys than girls, they spend over two thirds of their time with boys, they consistently reward boys for their effort and good performance, while praising girls for neatness; and boys in coed classes actively harass girls, monopolize space, and limit girls participation in game activities (Vertinsky, 1992, pp. 378-380). In large urban coed classes of 100 students, girls are at a disadvantage and suffer the ill effects of the situation at a very critical time in their psychological development. Lacking adequate motor experiences, they are often called "motor morons" by their male peers. This has negatively effected their self-esteem and confidence. One of the saddest facts is that in the 1990s when health care and prevention has taken a priority position on our nation's agenda, girls--especially girls in inner city programs--are scoring lower than boys on health-related fitness tests (AAHPERD,1987; Catelli et al., 1992; Gortmaker et al. 1987; Gutin et al., 1990; Wughalter, 1990). Thus, the project engaged in was to begin to rectify the situation and implement substantial change for girls in physical education. The following sections of this paper describe a model project, highlighting selected findings of the action studies and the curriculum intervention strategies that were employed to effect change for girls in an urban, middle-school physical education program.

Description of the School-College Model and Action-Research Studies

Recognizing the problems that confront girls in urban school physical education, and recognizing the need for change that directly targets peoples' attitudes, the physical education teachers of the Louis Armstrong Middle School (LAMS), and director of SCOPE designed and implemented a school-college model strategy to institute curriculum change and improvement. The strategic model implemented was to eradicate gender-biased practices against girls, slowly remove barriers that separate boys and girls, and substantially alter instructional conditions and curricular content to ensure equity for girls, and quality physical education for all students of the school. Pictorially displayed below is the overall school-college strategic model for instituting change.

Figure 1: School-College Model to Institute Change

Stage 1 →	Stage 2 →	Stage 3
Formulation of Ideas, Identification of Problems, Development of Curriculum and Research Skills .Summer Workshops . Working Seminars . Research Team Meetings	The Design and Conduct of Action-Research Studies .Training in Action Research . Conducting the Study . Analyzing Data	Use of Data/Findings to Effect Change . Oral and Written Presentations . Curriculum Intervention and Revision . Monitor/Assess Change

Adhering to SCOPE's holistic approach to education reform, the project involved the college's preservice and inservice teacher education programs, the school's curriculum, and staff development program. Thus, the education and coordinated efforts of the college's student teachers assigned to the school, the preservice students enrolled in a teacher education course taught at the school, the graduate interns registered in a master's level education program and the teachers' involvement in the school's staff development program were all intertwined in this project to effect fundamental change. Figure 1 provides an overview of the plan, indicating the major component parts and stages of the model. The focus here are two of the action studies of the research component that were conducted, and the uses of the data to initiate, support and monitor change.

The first action study is a longitudinal study of individual and group change in

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health-related fitness performances of a sample population of LAMS student population. Over a four-year period of time (1987-1991) data were collected and analyzed to determine change in health-fitness levels of the sample population. Fifth grade girls and boys were followed through to the eighth grade. Fitness levels for the five components comprising health-related fitness--cardiovascular endurance, body fat, flexibility and muscular strength and endurance--were measured and recorded for seven testing intervals over four years using the *Physical Best* battery of tests (AAHPERD, 1988). Descriptive statistics were used to identify individual and group change. Comparisons of age, sex, group means, along with comparisons with health-fitness standards set by the medical and health professions were made. In essence, the study attempted to answer the questions, just how physically fit are our youngsters at the middle school and are girls performing equally as well as boys with regard to health standards, and one another? Also, in 1989, a representative sample of the total school population (n=1400) was assessed with regard to the five components of health-related fitness. The resulting information from both procedures identified fitness levels, the needs of the female population and the differences between the sexes. The findings were extremely instrumental in initiating, supporting and monitoring change. The information obtained provided base-line data and valuable direction for the development of relevant and realistic health-fitness units of instruction for girls.

It was not surprising to find from a review of the data obtained for each of the testing intervals, that (1) a high percentage of females involved in the study fell below health standards established by the medical and health professions for cardiovascular endurance (a range of 57% to 73%), abdominal strength and endurance (a range of 57% to 91%), and upper-body muscular strength (a range of 87% to 100%), and (2) females scored lower than their male counterparts on these fitness components. Girls in this society are not encouraged to participate in vigorous activities or in a wide range of motor activities that develop different sets of muscles. And yet we know from research that each of the five health-fitness components is related to a health problem that might arise later in life, e.g., coronary heart disease, obesity, and low back pain. Such hypokinetic diseases have been directly linked and associated with lifestyles that are lacking in adequate physical activity (AAHPERD, 1988). Poor levels of fitness on the components contribute to the development of hypokinetic disease. Over the years of the study, girls' scores improved for cardiovascular endurance and abdominal strength. However, the mean performances gains of the girls were lower than those of the boys; and both sexes fell below health-fitness standards for cardiovascular endurance, muscular strength and endurance. It should noted that the health-fitness standards set for girls are lower than boys. Some educators believe that setting different standards is inherently sexist and that we should use one criterion for both boys and girls (Williamson, 1993, pp. 20-21). Regardless, the fact is that serious intervention is needed to provide young females with instructional environments that emphasize the improvement of health-related fitness.

The second study is a survey questionnaire requesting LAMS parents, teachers, students and administrators (n=1105) to rank goals of a "quality" comprehensive physical education curriculum for an inner-city, middle school pupil population. Here we were asking LAMS male and female populations what they wanted from their school's program in physical education. The study, conducted in 1989, two years after the start of the longitudinal fitness study, was to assist in identifying and monitoring the population's preferences for goals of a curriculum. Also, the action study occurred at a time when we were beginning to lose support for change. We knew that if perceptions and priorities differed substantially among the groups cited above and between the males and females, then fundamental change efforts would be stifled or come to a halt. Descriptive statistics were used to identify preferences and priorities of the population surveyed. Frequencies and percents were computed for each group, grade level, gender, and for each goal item.

Comparisons between and among groups were made. The resulting information was presented at formal meetings to administrators and the school's, site-based management team consisting of parents, teachers and students. The information elicited tremendous support from parents and administrators for the desired changes. It was very useful in elevating the status of physical education, and in identifying the different curriculum goal preferences of the school's male and female population.

Results of the survey revealed that the highest percentage of all respondents (40.8%) selected "health and fitness" as a first choice goal for an urban middle-school curriculum in physical education. Teachers, parents and sixth grade students, each as a group, ranked it as number one, and selected it as their first choice goal. As a second choice for a curriculum goal, "self-understanding and self-esteem" was ranked as number one. However, there were differences among the males and females of the study with regard to selecting a priority for a second and third choice goal. A higher percentage of all females respondents selected self-esteem and self-understanding as a second and third choice goal, while a higher percentage of male respondents selected "enjoyment" and "skill efficiency of movement" for second and third choice goals, respectively. It was interesting to note that eighth grade girls selected "self understanding and self esteem" as a second choice goal and sixth and seventh grade girls choose it as a third goal for a curriculum. The resulting information indicated what male and female students want from a physical education experience and what their parents and teacher want for them. While both sexes want health and fitness, and ranked this as the number one goal, females and males differed in what they preferred as their second and third goal experiences. This, of course, impacts the curriculum's content, the way it is taught, and how classes are scheduled.

Before identifying the outcomes and curriculum changes it is important to illuminate the uses of the research findings, which were powerful tools for orchestrating change. Overall, the actions studies served to initiate, support and monitor change for the school's female population. The findings of the studies were used to: (1) provide base-line data for assessing and monitoring health-fitness performances of a sample of the school's female population, (2) identify the health-fitness needs of girls, (3) persuade school administrators of the need to change scheduling practices of class periods, and to reduce class size, (4) convince the school-based management team to support revisions in the school's curriculum and educational policy, support, and (5) alter instructional practices and curriculum content of the physical education program to promote equity for girls.

Curriculum Intervention and Outcomes

The questions asked are, what changed and what are the outcomes? To begin, as a result of an analysis of findings of the first two fitness testing sessions, a specialized "coed" class in health-related fitness and aerobics was designed and incorporated in the curriculum. Units of instruction for the class were based on the assessed fitness needs of girls and boys. During class sessions, girls were afforded structured opportunities to discover areas of fitness they can perform just as well as, or even better than boys, i.e., flexibility. Boys engaged in jump-rope exercises for endurance--which they then no longer perceived as a girls' activity. Upper body activities for muscular strength--the girls' weakest area--along with cardiovascular endurance were emphasized. Additional fitness lessons were designed by the college's preservice students and students teachers, which significantly contributed to improving the fitness and the motor experiences for girls. Procedures for bi-annual testing of fitness levels of all students became a curriculum policy. Girls began to talk more about fitness. Their scores improved on the health-fitness components in the final years of the study, and on the 1989 curriculum survey, girls ranked health-related fitness as a priority for a second goal for the curriculum. This was not the case prior to the project. Previously, just the mention of fitness to girls would elicit from them a negative and distasteful reaction. Their parents and teachers, overwhelmingly, ranked it as the number one choice for a curriculum goal. Girls knowledge about fitness changed. They acquired and demonstrated accurate knowledge about (1) the five components of health-fitness, (2) the tests and activities that are used to measure health-related fitness, and (3) they individually charted their health-fitness improvement.(4)

Also, approximately fifty percent of the school's physical education classes became "truly" coeducational experiences. Previously, classes were scheduled in which boys were assigned to one half of the gymnasium and girls the other half. In these new coed classes instructional units were taught with girls and boys participating together. Perhaps, the most significant change was the support we were finally able to receive from administrators. They did a most courageous thing, they agreed to reduce class size and revise scheduling practices. This permitted the creation of an educationally sound and instructionally-sensitive environment to meet the specific needs of girls. Classes of 33 students with one teacher, along with the inclusion of the college's teacher education students reduced the student-to-teacher ratio to 10 to 1. This is a key factor in instituting change and gender equity for girls in urban settings. In conclusion, the following list highlights the important changes:

- Smaller class size, allowing for a more teacher-controlled, gender-sensitive physical education environment for girls. Girls no longer were placed in large class situations where boys often monopolized game activities, and harassed girls.
- Lower student-to-teacher ratio permitting more individualized attention for girls in the areas of fitness and motor skill development.
- Increased levels of physical activity of girls, and increased numbers of practice trials for girls to acquire motor and sport skills--both due to fewer students in each class.
- Revised course offerings for girls e.g., flag football, traditionally a "male" sport.
- Revised schedule of class periods more appropriate to achieving instructional objectives in health-related fitness for girls. Increased frequency of class periods and the institution of double periods for selected grade-level classes.
- Implementation of specialized coed classes in health-related fitness and aerobics, based on data/findings of the study, and designed to foster fitness improvement and mutual respect for and by both sexes.
- Development of lessons in health-related fitness targeting girls' assessed fitness needs.
- Institution of procedures for bi-annual testing and assessment of pupils' fitness levels.
- The improvement of girls' scores on components of health-related fitness.

The proposed next step is the development and implementation of an in-school, and an at-home intervention program to systematically increase girls' levels of health-related fitness.

Notes

[1] The Louis Armstrong Middle School (LAMS) was started in 1979 as a joint venture between Queens College and the New York City Board of Education. The purpose of the collaboration was to develop an innovative curriculum for middle-school students in all subject areas, and to design new forms of preservice and inservice teacher education. The project is a successful venture for both the school and the college. Project SCOPE has been a part of that collaboration between Queens College and the school since its inception.

[2] Project SCOPE is a partnership program between Queens College personnel and school practitioners representing nine schools in the New York City. Over the fifteen years of its existence, the members of SCOPE have produced more than twenty-five collaborative works and action research studies that have impacted teacher education and school curriculum via a "holistic" school-college model approach. The project is supported through the cooperative efforts of the College's Center for the Improvement of Education, Department of Health and Physical Education and School of Education. For an in depth explanation of the project see Catelli (1992a).

[3] For an historical account and an analysis of women, sport and female sexuality, the reader is referred to Lenskyj (1986), and for the presentation of a gender-awareness model, and a preliminary curriculum of resources and literature for creating a new educational environment for girls see Catelli (in press-a, in press-b).

[4] Many of the girls' knowledge and performance changes in the area of health-fitness was due the untiring efforts of Bonnie Mongiello along with Kenneth Moskowitz and James Jordan's project work, and then principal, Mary Ellen Levin's supportive contributions.

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The Influence of Gender Connotations on Children's Play and Learning

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Gender connotations conveyed through labels, sex-typed images, and feedback from significant others, signal to girls and boys which activities and objects are sex-appropriate (2,3,11). Children's reliance on such cues is motivated by the desire to identify with their own sex-group, to win praise and to avoid negative reactions from adults and peers (2,7,13). Consequently, the gender connotations associated with various activities can either provoke interest, or steer children away from participation in many developmentally beneficial initiatives (2,3,7,11). This paper describes how sex differences in children's play shape gender distinctive classroom interests and achievement patterns. The research presented here illustrates ways that children's play choices are influenced by gender connotations, and provides direction for ways to encourage children to engage in a balanced array of initiatives in child care, recreational settings and school.

The sex-typed play initiatives of girls and boys provide each group with a different set of experiences from which they derive knowledge, skill and confidence when facing opportunities and challenges in school and beyond (4,8,11,13,14). For example, boys' extensive participation in sports and large group games promotes leadership skills, an understanding of complex strategies and rules, achievement of goals, and friendly competition (11,12). At the same time, girls' play in small group turn-taking games (e.g. hopscotch, jump rope) promotes verbal skills, physical control, and cooperation among players (9). In addition, "girls' play" with dolls, tea sets, and cut and sew crafts, strengthens social and verbal skills, small muscle dexterity, and attention to detail, beneficial when learning to read and write (10,13), while "boys' toys" (e.g. erector sets, electric trains) enhance visual-spatial skills and familiarity with science concepts involving structures and forces, motion, speed and distance (8,10,14).

The familiarity with concepts that girls and boys gain through their various play experiences can enhance their confidence and competence in classroom subjects that apply similar or related principles and skills (1,4,8,10). Conversely, it is difficult for students to develop the confidence and motivation to follow a course of study which relies on skills and abilities drawn from initiatives with which they have had little experience (1,4,14). Girls' limited play with construction sets, mechanical toys, and other masculine-typed initiatives which enhance familiarity with science and math, contributes to their failure to pursue continued study in these areas (1). It is in this way that sex-typed play experiences shape gender distinctive academic interests and career aspirations (4,8,14).

Countering the limiting effects of gender connotations on children's play choices requires a clearer understanding of the conditions resulting in the selection and avoidance of sex-typed options. Toward this end, research was conducted which examined the influence of connotations on children's activity choices. This study was conducted in two phases with 414 children, eight to eleven years of age, from school-age child care settings and classrooms in southern and central Maine. In Phase I, gender connotations of 54 play initiatives were established. In Phase II, children's play choices were examined when presented with 48 pairs of activity options, arranged according to different combinations of masculine, feminine and gender neutral connotations. In addition, both surveys examined the frequency with which children participate in 23 common play initiatives.

Phase I Survey (N=159). A total of 84 girls and 75 boys categorized a variety of activities according to the gender composition of play groups that typically engage in each. Subjects' responses were translated into numerical ratings for each activity based on point values associated with each category: "Just Girls" =1.0, "Mostly Girls" =2.0, "Both Boys and Girls" =3.0, "Mostly Boys" =4.0, and "Just Boys" =5.0. Activity mean scores were then calculated.

Phase I Results: Gender connotations of fifty-four play initiatives were established and ranked according to their mean score values on a five-point scale (see Table 1). Activities with feminine connotations had mean score values (MSVs) ranging from 1.4 to 2.4 points. Feminine-typed initiatives with lower MSVs convey stronger connotations than those with higher MSVs. Gender neutral ("N") activities ranged from 2.7 to 3.5 MSVs, and activities with masculine connotations ("M") had MSVs ranging from 3.6 to 4.4. Higher scored masculine initiatives convey stronger connotations than those with lower MSVs.

Table 1

Phase I Gender Connotation Scale of Children's Play Initiatives

1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

FEMININE	MSV	NEUTRAL	MSV	MASCULINE	MSV
Cheerleading	(1.4)	Ice Skating	(2.7)	Basketball	(3.6)
Build Doll House	(1.5)	Fly Kites	(2.7)	Floor hockey	(3.7)
Baton Twirling	(1.6)	Roller Skating	(2.8)	Pool Table	(3.7)
Hopscotch	(1.7)	Paint Pictures	(2.8)	Kickball	(3.7)
Jump Rope	(1.8)	Drawing	(2.9)	Baseball	(3.8)
Hula-Hoop	(1.9)	Puzzles	(2.9)	Archery	(3.8)
Cooking	(1.9)	Modeling Clay	(2.9)	Build/Wood	(3.9)
Dancing	(2.0)	Tag	(3.1)	Air Hockey	(3.9)
Make Cookies	(2.0)	Computer Games	(3.1)	Paper Planes	(3.9)
Basket Weaving	(2.0)	Volleyball	(3.1)	Karate	(4.0)
Make a Garden	(2.1)	Bld. Bird House	(3.2)	Skateboarding	(4.2)
Gymnastics	(2.2)	Relay Races	(3.2)	Ice Hockey	(4.3)
Make Puppets	(2.3)	Wiffleball	(3.3)	Football	(4.4)
Pottery	(2.4)	Video Games	(3.4)		
		Dodgeball	(3.5)		
		Legos	(3.5)		
		Soccer	(3.5)		

Note. Neutral items not shown include: make stick boxes, nature walk, paper mache, make face mask, frisbee games, ping-pong, build castle, horseshoes, capture-the-flag, and Nintendo.

Phase II Survey (N=255). Using the results from Phase I, the Children's Activity Preference Survey (CAPS) was developed (Cronbach/Alpha reliability =.80). The CAPS questionnaire presented eight sets of activity options for each of six different conditions: feminine vs. masculine (F/M); masculine vs. masculine (M/M); feminine vs. feminine (F/F); neutral vs. masculine (N/M); neutral vs. feminine (N/F); and neutral vs. neutral (N/N). Subjects were asked to select one activity from each pair of options they would most prefer to play.

The scoring procedure for subjects' sex-typed activity selections was based on the frequency with which they chose activities most consistent with their sex, as determined by activity MSV positions on the gender connotation scale. Thus, scores were tallied for boys each time they selected activity options with higher MSVs (indicating higher masculine/lower feminine connotations), and for girls when they selected options with lower scores (indicating higher feminine/lower masculine connotations). The frequency distributions of sex-typed selections made by girls and boys for each pairing condition, were analyzed and compared. Chi-square analyses were performed to examine differences in sex-typed choices due to condition, and differences in choices made in each condition by sex.

Phase II Results: A significant effect of pairing conditions on sex-typed activity selections was obtained. Results show that the majority of girls tended to select lower scored activities, closest to the feminine end of the scale, when presented with alternatives with stronger masculine connotations (e.g. F/M; M/M; N/M), as shown in Figure 1. Conversely, girls' selections favored high-scored initiatives when F/N; F/F; and N/N conditions were presented. For example, girls made significantly more sex-typed selections when presented with F/M options than when presented with F/N activity pairs: $x^2(8)=43.92$, $p<.001$; when selecting from M/M play options vs. F/F alternatives: $x^2(8)=40.94$, $p<.001$ and when presented with

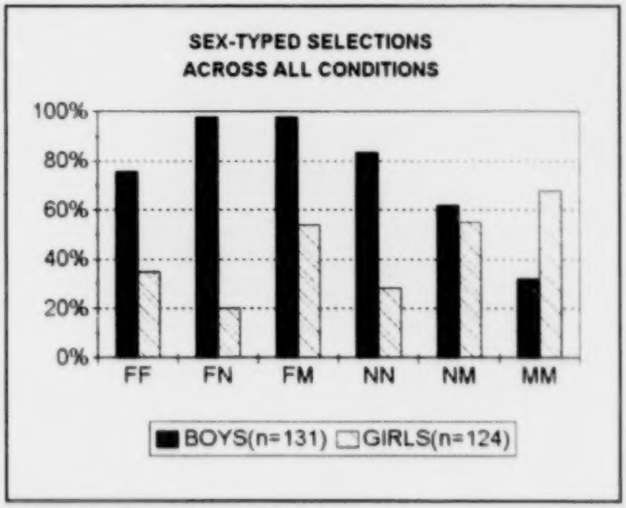

Figure 1. Phase II CAPS Results.

N/M vs. N/N activity options: $x^2(8)=28.81$, $p<.001$. Overall, girls' selections tended to favor gender neutral initiatives, as when presented with N/M activity pairs 55% selected neutral over masculine alternatives, while 80% chose neutral over feminine options with greatest frequency when presented with F/N pairings.

In contrast, boys' selections tended to favor activities positioned closest to the masculine end of the scale. Their selections increasingly favored the higher scored options as connotations became more distinct from one another, and as their positions fell further away from the masculine end of the scale (see Figure 1). For example, boys made significantly more sex-typed selections when choosing between N/M vs. M/M options: $x^2(8)=55.18$, $p<.001$; between N/N vs. M/M options: $x^2(8)=93.74$, $p<.001$; and when choosing between F/N vs. N/M options: $x^2(6)= 173.53$, $p<.001$.

Results revealed that girls made significantly fewer sex-typed selections ($\bar{X}=24$) than male subjects ($\bar{X}=35$) overall, $t(197)=17$, $p<.001$. In addition, girls were found to be less inhibited from making cross-typed activity selections than boys. For example, significantly more girls chose masculine-typed activities than boys chose initiatives with feminine connotations when presented with F/M options: $x^2(8)=178.42$, $p<.001$.

Frequency of Participation ($N=414$): Subjects from both Phase I and Phase II were asked to indicate the frequency (Never, Sometimes, Often) with which they participate in twenty-three common play initiatives. Results revealed significant effects for sex in frequency of participation for a total of twenty initiatives. Activities that girls reported they play most often had mean score values ranging from 1.7 to 3.1 on the gender connotation scale. They included one sport: softball ($p<.001$); four low-complex, small group games: hopscotch ($p<.001$), jump rope ($p<.001$), tag($p<.001$), and hide and seek ($p<.01$); and three creative arts initiatives: dance ($p<.001$), art projects ($p<.001$) and modeling clay ($p<.05$).

Activities that boys were found to play most often had MSVs ranging from 3.2 to 3.7, and held higher neutral and masculine positions on the gender connotation scale. These included: run races ($p<.01$), play catch ($p<.001$), kickball ($p<.001$), capture the flag ($p<.001$), dodgeball ($p<.001$), basketball ($p<.001$), floor hockey ($p<.001$), baseball ($p<.001$) soccer ($p<.001$), video games ($p<.001$), air hockey ($p<.001$), and Legos ($p<.001$).

The three initiatives in which girls and boys participated with similar frequency included two gender neutral activities (MSVs=2.9): drawing ($p\geq.05$) and puzzles ($p\geq.05$), and the game of "Seven-up", ($p\geq.05$).

CONCLUSIONS: Results of this research provide evidence that the types of play choices children make, are in part, a product of the types of options that they are presented (6,7). When options are easily distinguished from one another on the basis of sex, gender connotations appear to play a stronger role in children's decision making than when options have similar connotations (6). For example, when presented with the F/M options: hopscotch and making paper airplanes, 4% of boys and 67% of girls chose hopscotch. However, when presented with the F/F options: hopscotch and gardening, 46% of boys and 40% of girls chose hopscotch.

Although the presentation of two masculine-typed or two feminine-typed initiatives may not at first glance appear to offer a fair choice, in fact, such options make it "safe" for children to choose freely from initiatives they may otherwise feel pressure to avoid (6). Since one activity does not appear to be any more sex-appropriate than the other, there is less risk of embarrassment or negative feedback for making the "wrong" choice. Thus, it was observed that boys' avoidance of low-scored feminine activities was significantly less when presented with two feminine-typed options, than when presented with F/N ($p<.001$) and F/M option pairs ($p<.001$).

These results provide valuable information to those who offer activities in child care, school and recreation settings. For example, the findings suggest that when gender distinctive classes (e.g. "Shop" vs. Home Economics; or Baseball vs. Dance) are scheduled in competing time slots, children will be more likely to discriminate between them on the basis of sex. Such types of forced choice options set up barriers against children's exploration of non-traditional activities.

As observed in previous research, the female subjects in this study made significantly fewer sex-typed selections than males (3,6,7). Moreover, girls' selections favored gender neutral activities over those with feminine and masculine connotations (7). Girls' apparent avoidance of feminine-typed activities, as when presented with F/N options, may reflect an awareness that feminine initiatives tend to be generally less valued than those of boys (7), or may be indicative of a desire to broaden their repertoire of play experiences beyond the traditional. Thus, as many as 46% of female subjects selected masculine-typed activities over feminine-typed alternatives, while 45% selected masculine-typed initiatives over neutral options.

Like in a game of "rock, paper, scissors", boys appeared to weigh activity options according to the relative appropriateness of each. Findings revealed that the majority of boys tended to select masculine activities over neutral, and over feminine options; high-scored neutral over low-scored neutral activities; neutral over feminine; and chose high-scored feminine over low-scored feminine activities with greatest frequency. This pattern of response demonstrates how different arrangements of play options can encourage children's selection of activities they may otherwise avoid. For example, 62% of male subjects avoided neutral items when presented with masculine-typed options, whereas 98% chose neutral items with greatest frequency when presented with feminine-typed alternatives.

Although girls appeared to be much more flexible than boys in their play choices when selecting from the options on the Phase II survey, it was found that they actually engage most often in highly sex-typed play initiatives. These results suggest that despite their interest to engage in less traditional activities, girls continue to face barriers at home, school and child care, which prevent them from doing so.

Results of this research indicate that it is possible to encourage children's selection of a more balanced array of options through the careful consideration of the connotations associated with them. Program evaluation of school-age child care and recreation services should include activity skills assessments, and an examination of the gender composition of play groups for various activities. Strategies, such as the use of activity titles which overtly convey inclusion (i.e. "coed soccer"); the offering of single-sex classes for cross-typed activities (e.g. "girls bike repair", "boys cooking"); and use of models in non-traditional roles, can help to modify the effects of gender connotations and stereotypes on children's activity choices. Without such messages of support and inclusion, it should be no surprise that when confronted with opportunities to engage in initiatives more common to the other sex, the majority of children will likely "choose" not to join in.

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The Dyadic Interactions between Physical Education Teachers and Kindergarten Children based on Gender

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The purpose of this study was to ascertain the duration and type of dyadic interactions that occurred between 20 elementary physical education teachers and their respective kindergarten students in terms of two variables: student gender and teacher gender. The type of dyadic interactions measured were the evaluative dyadic interactions of praise, acceptance, remediation and criticism. In addition the content of the interaction (i.e., does the interaction refer to the quality of the student's performance, the student's appearance, the student's conduct, or other?) was also examined. The amount (i.e., ratio and mean duration) was also ascertained for each of these dyadic interactions.

To obtain the data for this research, 20 elementary physical education teachers were video taped while teaching one class of kindergarten children. The results from these video tapes were coded onto a modification of the INTERSECT (The Network, 1982) observation form which was adapted for use in the gymnasium.

A one-way analysis of variance was employed to determine if there were significant differences between male and female teachers in the quantity or mean duration of their dyadic interactions with their students.

Ratio computations were performed for each teacher and in each category in which a dyadic interaction occurred. This procedure compensated for the unequal number of male and female students in each class. Mean durations for each category of interactions were also determined. A 2 X 2 (teacher gender by student gender) analysis of variance with repeated measures of the second factor was performed for each category. The recording and analysis of the dyadic interactions that occurred in 20 elementary kindergarten physical education classes were used to examine the dependent variables of amount, content, and evaluative form of those interactions. The relationship between these dependent variables were examined within the context of the quasi-independent variables of teacher gender and student gender. Each of these independent variables will be discussed in terms of statistical analyses.

Findings

Teacher Gender

The results of this study revealed that male and female teachers did not differ significantly in the total number of dyadic interactions they engaged in with their students. In the present study, there was also no significant difference between male and female teachers in the mean duration of their total number of dyadic interactions.

Student Gender

A total of 2053 dyadic interactions, that could be attributed to a male or female student, were observed in this study. These interactions were recorded into 1 of 16 categories of the modified INTERSECT observation instrument. Five of these categories produced a sufficient amount of data for statistical analysis. These categories were: praise-quality, accept-quality, remediate-quality, accept-conduct, and remediate-conduct.

While this study reported no significant differences between male and female kindergarten students in the ratio of interactions praising the quality of their performance, there were significant differences in the less precise interaction of acceptance of quality. It was found that male students received a statistically significant ($p<.05$) greater ratio of interactions in this category than did female students.

While the present study found that males received more interactions that implied acceptance of the quality of their work, it was also discovered that they received a significantly greater ratio of interactions in remediation of their work. Analysis of variance computation revealed male students received a statistically significant ($p< .01$) larger ratio of interactions in this category.

While there were no statistically significant differences in the area of accept-conduct, male students received a statistically significant ($p<.001$) ratio of the interactions that remediated their conduct.

Insufficient data were observed in the present study to evaluate the praise, acceptance, or remediation of appearance. It should be noted, however, that anecdotal information revealed the tying of shoes and the adjusting of scrimmage vests were the foci of the overwhelming majority of the teacher-student dyadic interactions in this content area.

Conclusions

Within the limitations of this study, it was concluded that teacher gender was not a factor in the total quantity or mean duration of teacher-student dyadic interactions of elementary physical education teacher when working with kindergarten children.

Within the limitations of this study, it was concluded that male kindergarten students received preferential treatment by their physical education teachers with respect to the quality of their work in the areas of acceptance and remediation. Male students received a greater ratio of interactions that acknowledged their performance was acceptable and a greater ratio of interactions that would remediate their performance. It may be argued that perhaps the male students were performing the skills correctly and would therefore warrant additional interactions that

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the male students were performing the skills correctly and would therefore warrant additional interactions that acknowledged their success. However, if the female students were not as successful, they should have received the greater ratio of interactions that remediated their performance. Yet, they received a significantly lower ratio of interactions in this area. Further research is needed, as these findings may be the result of statistical error due to the large quantity of analyses performed.

It may also be concluded, within the limitations of this study, that male kindergarten children dominated the number of conduct remediations that occur in their respective physical education classes.

Discussion

The literature has been consistent in reporting that male students receive more conduct remediations than their female classmates. The Sadkers have reported that classes can be dominated by a few students who demand, through their actions and calling-out patterns, more attention. In addition, recent research, including this study, reveal that female students receive fewer interactions that promote learning from their teachers. Perhaps all three of these circumstances are linked.

In kindergarten, boys and girls are equitable physically and cognitively. They may not be equal, however, in their capacity to follow the new structure that formal education demands. Societal and parent influences prepare girls to play quietly, and sit and listen. Generally, boys do not receive the same reinforcement for this behavior. As a consequence, girls are better prepared than boys to listen to the teacher and conform to the school rules.

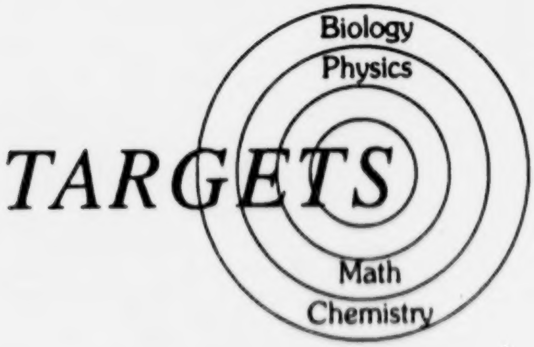
Perhaps inequitable treatment in teacher-student interactions is due to management problems, not bias. In physical education, teachers are required to cover "X" amount of material in a very short period of time. Perhaps teachers interacted with the "discipline problem" children in a positive manner (e.g., accepting-quality) on a more frequent basis as an attempt to keep those children on task. Management should not drive instruction, but it may be doing just and as a consequence it is producing unequal treatment

All actions have antecedents, which promote behaviors, which produce consequences. Research has been limited to the teacher behaviors that have consequences for their students. Future research must address the antecedents, the "whys" of teacher behavior.

In this study, two teachers were found to be totally equitable in their treatment of boys and girls. Research is needed to discover what management procedures teachers like these use. Once these methods are discovered, they should become part of teacher training. The purpose of education is to teach all children, not just the ones who are more overt in their actions.

TARGETS

(TRACKING AND REACHING GIRLS FOR EQUITY TRAINING IN SCIENCE)


Biology
Physics
TARGETS
Math
Chemistry

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TARGETS

(TRACKING AND REACHING GIRLS FOR EQUITY TRAINING IN SCIENCE)

TARGET is a pilot science program presently operating on a high school campus in Greenville County, Piedmont, S.C. This County is located in the upper part of the state. The school, Woodmont High is situated in a rural section of the county and has an enrollment of approximately 850 students. These students come from various socioeconomic backgrounds. Although only approximately twenty-five percent of the graduating class pursue higher degrees after high school; the school's curriculum was generally designed for the college preparatory student, however, until recently, the technical preparation program (applied academics) has been added to the existing curriculum to address the needs of those students going directly into the workforce.

The science program, traditionally, has always attracted a large enrollment of males in all disciplines, but the enrollments of females have always typically, been extremely low. Observation over the past seven years has shown a gradual increase in the enrollment of females, especially minorities, in the sciences. Before 1987, the chemical and physical sciences were taught by a male. Research over those years indicates a traditional type curriculum with a high enrollment of males. Physics was the highest advanced science. There were no science clubs or activities beyond the classroom. The numbers of graduates enrolling in college sciences were typically low.

Upon arrival at Woodmont in the 1987-88 school year, plans were immediately implemented to increase the female and minority participation in science. A female minority, teaching the advanced sciences, was not a sight to be embraced by some member of the community. Immediately, plans were made to gain the trust of students and the confidence of the community. An engineering club was formed. During the first three months, the club was coached after school to prepare for the state engineering contest. These students entered the contest in February and came away with first places in chemistry, math, and english. They placed second in biology and physics. Three girls were taught how to engage in scientific research and were coached into writing grants. They received grants to complete their research from the State Academy of Sciences. Students and the community began to show confidence and respect. That same year, forty-five students were taken to Florida on a tour of NASA. The following years, the enrollment of girls and minorities doubled. The percentage of enrollment of total girls and minority girls taken at random years thereafter are as follows:

HONORS CHEMISTRY

	1988-89	1990-91	1993-94	1994-95
TOTAL FEMALES	38%	48%	61%	50%
FEMALE MINORITIES	63%	19%	14%	29%

PHYSICS

	1988-89	1990-91	1993-94	1994-95
TOTAL FEMALES	46%	36%	68%	63%
FEMALE MINORITIES	25%	14%	16%	28%

CHEMISTRY

	1988-89	1990-91	1993-94	1994-95
TOTAL FEMALES	59%	53%	41%	68%
FEMALE MINORITIES	27%	22%	36%	30%

Although the enrollment increased, girls still felt somewhat intimidated by using equipment and algebraic manipulations. As a result, another strategy had to be employed. A strategy was formed which made girls feel confident, secure, and proficient in what they were doing. This brought about the conception of TARGETS.

The implementation of TARGETS was a smooth and efficient process. This transition was due primarily to the supportive efforts of the school's principal. Woodmont's principal, the only female secondary school administrator in a county of fourteen (14) high schools was very much attuned to the national statistics concerning female participation in math and science. She was not afraid of changes or implementing innovative programs which would ensure the confidence, success, and achievement of all students enrolled at Woodmont High. She endorsed the TARGETS program. Her major concern was that females, as well as males enrolled in the program, receive equity training in all aspects of the modified curriculum.

TARGETS was funded as a result of a fellowship and grant proposal submitted to the American Association of University Women (AAUW) Educational Foundation. The goal of the proposal was to develop effectively a systematic framework for teaching science to girls. The framework would target the existing curriculum by modifying teaching strategies which promote self-reliance, self-confidence, and proficiency in the

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mathematical sciences. The use of this approach along with an inclusion of math and science manipulatives, relevant class activities, and characters building seminars, were implemented to enable girls to overcome the barriers of high dropout rates, teen pregnancy statistics, and low standardized test scores in the mathematical sciences.

The TARGETS program initially began during the summer of 1994 with an intense teacher preparation period by enrolling in courses and seminars on the at-risk student, teen pregnancies, technologies, and video productions. This effort was followed by a gradual modification of teaching strategies in the fall and continuing with a progressive inclusion of parents, industries, and communities. During the beginning of the school year, students answered survey forms to determine their status in science as well as their use of manipulatives. The survey indicated the following:

SURVEY ENTRY I would understand math and science If I had:	PERCENTAGE OF STUDENTS RESPONDING
• a study buddy	80%
• hands-on-activities	80%
• field trip explorations	67%
• help from teachers	47%
• a tutor	20%
• computer programs	16%

Lessons were designed on the basis of the results of the survey and the answers given by students. Classroom activities were designed with a "hands-on" approach. Students received daily assurance of their work with verbal praises such as "You Are Wonderful" or "WONDERFUL!" This became a key word on campus used by these students, including some not enrolled in the TARGETS program. Students began to assure each other that they were "WONDERFUL" when tasks were completed in science. Students were placed in cooperative learning groups. They were assigned a study buddy in the class to check each others homework, get assignments when one was absent, and discuss laboratory results. Students were assigned mentors from industry, local colleges, AAUW, and the air force reserve. They received weekly seminars in character building, self-esteem, use of computers, and the graphic calculator. Students also visited local industries to see science in the work force as well as local colleges. A speakers' bureau was initiated whereby professional women from the community came in to talk on topics such as "Breaking the Barriers," "Erasing the Stereotype," "Women with Success Stories," "I Think I Can, I Know I Can," and many other interesting subjects.

A TARGETS club was formed which now has approximately seventy-five (75) members. The club is dedicated to increasing test scores in math and science, technology, and computer literacy, mentoring, self-esteem and community involvement. Students services performed by the club are computer graphics, video production, tutoring, mentoring, community action, science projects, science competitions, and writing scientific papers. The club has twenty-five (25) boys who have joined as TARGET supporters. Members of the club go to the elementary, middle, and nursery schools to perform hands-on activities in science, careers, and technology.

A TARGETS II Club has been formed at the middle school. Approximately twenty-five (25) to thirty (30) students come to the high school in the afternoon once per week for hands-on activities using the graphic calculator, video cameras, and to hear the self-esteem seminars. Parents and the community are eager to help TARGETS. Several parents participate on field trips as well as help sponsor activities. Functions sponsored by TARGETS are:

1. EXPO "94" Women in Science: Science demonstration site where twenty-five (25) women set up booths to demonstrate science at work. Local AAUW members served along with parents as hosts. This event was held in the school gymnasium.
2. Overnight trip to the Science Academy at the South Carolina Governor's School of Math and Science at Coker College in Hartsville, South Carolina.
3. TARGETS on Wheels (presentations to elementary schools).
4. TARGETS Directory - business resources that support TARGETS.
5. Community cleanup project.
6. Participation in local Science Fairs.

ON-TARGET SUPPORTS

- Two girls have received Air Ford Academy Scholarships.
- One girl and one boy have received research grants.
- Three members have engaged in community research on a polluted river and have applied for a $40,000.00 scholarship in environmental education.
- Five female minority seniors are majoring in chemical and/or electrical engineering (with scholarships).
- Eight female seniors are majoring in science related fields (three with scholarships).
- All girls know how to use graphic calculators in lab-based activities.
- Girls have applied for several scholarships and awards in science.
- A TARGETS II Club has been organized.
- TARGETS was adopted by the women in the local Air Force Reserve.
- TARGETS received commendations from local members of the County Council for

work in the community.

- One student received commendations from the Academy of Science for research projects.

These students will be tracked each year over a five (5) year period to determine the number of girls pursuing careers in science and related fields.

University Students Promote Gender Equity through Interviews

Rose Marie Cutting
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Encouraging students to become participants in gender research projects is one of the most successful strategies for guaranteeing that the research will have an actual impact on the educational process. In some of the courses that I teach (courses in composition and journalism) I set up projects focusing on gender; these projects satisfy part of the writing requirement of the course. For example, students may be encouraged to write up and share interviews on issues relevant to gender at our university.

In some of these interviews, students question faculty on the role that research on gender plays in the content of their courses, in the pedagogical methods they use, and in the research and writing they do in their disciplines. Such interviews give students an inside view of the process whereby issues relevant to gender are becoming incorporated into fields of study and into the curriculum. In addition, this work allows students to make contact with faculty who are knowledgeable about gender issues and about their impact on educational success.

Of course, some faculty are not good subjects for an interview on gender. The faculty who allow the time that it takes for a good student interview, however, are generally interested enough in the impact of gender on education to have significant views on this topic. In addition, they may be able to provide students with information on the status of gender research in their own discipline and to refer the students to other faculty in the university who are equally knowledgeable.

The faculty at St. Mary's University identify themselves primarily as teachers and secondarily as researchers. A significant number of the faculty--especially the females--are engaged in research on gender. This is particularly true in my department (English and Communication Studies), where at least one-third of the faculty, including several male professors, work on such projects for purposes of teaching and/or publication. One member of our communications faculty studies women's access to technology and the differences between male and female learning styles with regard to technology. One of the nuns in our department works on women in film and television and also on consensus formation in group decision-making. Six faculty members in the department work with gender as a category of analysis in literary studies, and several use gender as a topic in advanced composition courses. Majors in the department are likely to become acquainted with most of these teachers, but the non-majors in my courses would have limited exposure to them except for the interviews.

In addition, the interviews show students how gender research extends into all schools of our university. A faculty member in the Law School teaches courses on feminism and the law and publishes books on this topic. An elderly male physics professor gave the student interviewer pages of detailed information about negative effects of the gender bias against girls and women in the sciences. This professor and a woman faculty member from biology, along with one from communications, are working on a project to improve science education for girls in local schools. Students usually do not have any idea of the interesting work that is going on at their own institution. Letting them discover and write up reports on the work being done by professors at their own school encourages students to engage as active learners in their home environment.

There is no doubt that the interviews work as a form of "consciousness-raising" for the students who choose this means of satisfying course requirements. Some of the students who conduct these interviews develop a strong interest in gender as a topic of study and tend to ask for projects on gender in other courses. In addition, their interest and enthusiasm rewards the faculty who take the time to provide the interviews and encourages these faculty to make their work more accessible to students.

One question that students must include in the interview concerns whether the textbooks used in the professor's courses incorporate any of the contemporary research on gender. When students ask this question, well-intentioned faculty become less likely to neglect issues of gender equity when selecting textbooks, designing courses, and creating curriculum. Students, of course, often have no idea that the curriculum ought to incorporate information and approaches relevant to both genders, rather than simply subsume female under male identity.

The question of textbooks demonstrates to student that a problem still exists. For even faculty who are very sympathetic to gender research have sometimes not revised their courses sufficiently to reflect the explosion of research on women's issues during the past decades. St. Mary's University was founded as a male school and became co-educational in the 1960s. In the past decades, the university has shown the same shift to a majority female population that is occurring nationally in higher education. In the fall of 1994, the undergraduate breakdown of St. Mary's was 54%

female to 46% male. Since the majority of our student body in undergraduate school is female, females now outnumber males in many majors in the undergraduate curriculum (with some notable exceptions such as engineering). Yet the curriculum does not always address issues relevant or even vital to women.

Even when the textbooks chosen may have chapters on gender--such as a history book with a chapter on "women's history"--the faculty member may not realize that it is important to actually assign this chapter as a minimal contribution to transforming historical studies. The students I sent out to conduct interviews encountered faculty who did not really think there was a problem in skipping the only chapter focused on gender in their textbook. One of the best antidotes for such a problem is to have students show faculty that they are really interested in gender as a category of critical analysis and that they feel cheated when their education slights this aspect of academic disciplines.

The question of textbooks sometimes teaches students that they can help faculty find supplementary texts to provide a more balanced and diversified reading list for a course. For instance, one social science professor wanted a book on Tejanas for his course and could not find one he considered suitable. Through literature classes, the student who conducted the interview was well versed in the work of the Tejanas and other Latinas who have achieved literary success during the past decades, and hence the student could suggest some texts the faculty member might want to consider.

One of the questions from the interview that greatly interests students concerns whether faculty believe that females and males have different learning styles or prefer different methods of instruction. When the interviews were conducted in the spring of 1994, many of the faculty expressed the opinion that females prefer group work, collaborative projects, and more personal forms of writing such as journals. Some faculty believed that males prefer lecture and individual work, but there was less certainty about this. Surprisingly, a few faculty reversed these judgments. Many faculty said they did not think there was much difference, while one unusually honest faculty member simply said, "I don't know."

These opinions were sometimes based on decades of college teaching and hence not to be discounted in spite of their tentativeness. The judgments given about male preferences were made more complex by the fact that the majority of our undergraduates are Hispanic (63.34% in fall, 1994). A workshop on learning styles among Hispanics conducted for St. Mary's faculty--several years previous to the student interviews--had emphasized their preference for group work without doing any breakdown by gender. The university has obtained funding for a survey of preferred teaching styles and student learning styles which will produce a systematic study of these issues. This study will prove a major step towards changing opinion into knowledge based on research.

The diversity and tentativeness of the answers that students received about learning styles led to some important insights for the students who conducted the interviews. They seemed to be shocked into noticing that pedagogy itself may be as important to education as the content of courses, that pedagogy is not fixed but a developing and evolving aspect of education, that faculty need to keep abreast of current research on pedagogy as student populations change. They could readily understand that their own preferences had an impact on their success in some courses, and they sometimes felt empowered to ask for input into the instructional methods used in courses.

Interviewers were required to ask questions about gender and forms of technology used by the faculty in their teaching and in their research. Not surprisingly, most faculty acknowledged that there were differences in female and male access to and sense of ease with technology. Students generally agreed with the conclusions voiced by the communications professor, Maureen Ebben, whose research focuses on women and technology. She believes that women have very different learning styles with regard to computers from men: "Women want to be told what computers can do for them and are unwilling to just jump in and play with computers the way males do." Knowing this seems to help some women students feel more empowered about getting what they want out of technology without feeling guilty about not performing like a male.

Gender has also been an element in other writing projects that I have used with composition students. Having students interview their parents--focusing on the parents' educational history--has been the basis for some fine essays. This has proved particularly true with the Hispanic students. Often such parents provide tales of the hardships and discrimination they faced when in school and give moving testimonials to their determination to win a better education for their children. The educational disparity between the mothers and daughters is, of course, generally even greater than between fathers and sons. The contrast between the mothers' stories and those of their daughters provides concrete proof of the essential role higher education plays in helping women develop their potential and proves highly motivating for female students.

At the previous AAUW college and university symposium, I presented information about a project in which students interviewed past graduates of our university. Such interviews proved especially valuable for female students--since they are likely to have fewer role models and mentors in many professions, especially when they choose "non-traditional" careers. The contact with women who have graduated successfully and have achieved professional success is particularly vital for the Hispanic females, who may have doubts about their ability to complete college since they are likely to be the first females in their families to have the opportunity for education beyond high school.

In other courses, I have required that students interview themselves and/or other students in order to analyze and write up accounts of the factors that have hindered and contributed to their success in school. The focus of this work is on educational success rather than gender, but one aspect of the essay must, of course, clarify the extent to which the student believes gender is a factor in his or her educational history. The essays that result from this process convince me and the students themselves that the majority of female students are serious about education, work very hard, and deserve help and support.

The interviews and papers I am describing are written for humanities courses. Hence these papers do not present systematic or quantitative research. However, they demonstrate the power of humanistic learning to create and extend knowledge, to develop and transform consciousness. The specific information the students learn is not as important as the process. For the purpose of the process is to teach students that they themselves are responsible for asking the important questions about gender; they are the ones who must work to understand the impact of gender on their lives in order to empower themselves as fully as possible as students and as human beings.

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What's school got to do with it?
Adult Women's Reflections and Suggestions on the Role of Education in Developing Self-Esteem

by

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The research reported in this paper is an outgrowth of AAUW's 1991 and 1992 reports on "Shortchanging Girls" which document the sexism girls and young women experience in education and the detrimental effects this may have on their self-esteem. Using information collected from our research, we attempt to address equity issues for women and girls and programming issues to foster a woman/girl friendly educational climate.

We identified solutions to this problem through the following methods. Our research focused on adult women (ages 21-83) rather than young girls, since the former group has not been tapped adequately as a resource who can reflect on multiple life-experiences and offer solutions and strategies based on this enriched perspective. We conducted in-depth semi-structured interviews rather than surveys in an attempt to discover how these women perceive self-esteem issues in their own words. We asked what they identified as primary life influences on their self-image (rather than assuming, for example, that education played a primary and/or independent role), and we gathered ideas for coping strategies when struggling with self-esteem and solutions for parents and educators. We sought participants from a variety of backgrounds, collecting the life stories of women in the midwest.

Our goal in sample selection was not representativeness or generalizability, but rather we sought women who could teach us something about self-esteem. The education level of participants has been fairly high (e.g., all but five had more than high school degrees). Most of the women were in their 30's to 60's. There were 11 African American women and 32 caucasians. Most of the women described their self-esteem as fairly good to generally high (only two described it as "not so good," or "low"). (For more information on the sample, contact the authors.) In this paper, discussion of the results of the study is limited to our attempt to translate the women's experiences into programming possibilities.

Programming: Ideas From Women's Lives

From the information gathered, we have generated six interdependent programming suggestions described below.

Working from Girls' Strengths. In recent years, much has been written on sexism in the math and science fields and girls' and women's related insecurity and under-achievement in these areas. We ask, however, if in researchers' and educators' attempts to balance the scales in traditionally male dominated fields, we have begun to down-play the tremendous potential to raise self-esteem by working through areas girls and women more often excel in. The important point gleaned from the women in our study was that over time, the self-affirmations gained in one area can be used to balance and even enhance low self-esteem in another area of one's life.

While a transference of self-esteem from one realm to another may not always work, we heard examples where it did, such as Shaundra (not her real name) who has a history of excelling in school and believes being an avid reader helps her cope with "the body focus" which has been "overwhelming" for her. Or, consider Juanita, who "felt like a flawed creature" in school and raised her self-esteem on her own. She said, "I painted and every year I would try a new craft - that was the one good thing that I did for myself." For women like Juanita, school offered no outlet for an expression of their creative abilities. It took her a long time to realize that though she may not have excelled in the traditional subjects, she was still smart. She finally got her GED at the age of 28 and is currently pursuing a graduate degree.

Thus, we advocate curriculum inclusion of creative and extracurricular activities women and girls often value and excel in, such as creative writing, the oral traditions, relationship building, and other areas that engage the imagination and interest. These would provide a more holistic approach to raising self-esteem and to possibly make math and science more accessible.

Curriculum Directed at Developing Self-Identity. Part of the stress the women expressed regarding self-esteem was due to all the social influences which make it difficult for girls to be in touch with who they are and thus instead encourage them to rely on others' perceptions. These stresses came from many sources, such as an alcoholic parent; oppressive, unloving parents; unattainable societal ideals of body image; sibling comparisons; peer pressure to have a boyfriend; and an oppressive religious up-bringing.

Several of the women in this study described how over the years they became reconnected with their "inner self" which helped them to overcome oppressions and to raise their self image. As Darlene said, "Nobody's voice is as important as your own; if you try to be somebody that you're not, you'll be surprised who you end up becoming." The participants wished someone had helped them develop a stronger sense of self earlier in life.

Thus, we propose that the nurturance of one's inner voice be made a legitimate area of curriculum because it can lead to acceptance of self, reduce the "disease to please" (as some participants described constant efforts to gain others' approval, even if it meant compromising oneself), and can enable girls and women to excel in other areas of curriculum. Input from the participants offer several means for accomplishing a stronger sense of self. Journaling and other creative forms of expression are one means. Another is tied to developing self-discipline. Shawn explained,

> I believe that discipline is very critically integrated with self-esteem. ... To be a disciplined person is its own reward, because once you become a disciplined person, I think your choices are better. Otherwise you make choices based on what people are going to think of you, or you're going to make choices on what you are indulging at the moment.

In addition, a majority of the women in the study talked about the importance of risk-taking. Stretching one's self and learning about other facets of the self were seen as necessary to raise one's confidence and self-esteem. "A person with high self-esteem must have excelled in some way, . . . must be good at something and [has] taken risks to become good at something," Sheryl said. Programming in this area would also lend students opportunities to feel in control of their lives, which we know is an element missing for many females, particularly those suffering from eating disorders and/or oppressive parents.

Mentoring was also noted. If girls have strong, healthy adults as role models in their lives, it may be easier for them to develop a positive self-identity, especially when coming from adverse circumstances and backgrounds. As Chris noted:

> If there just would have been someone, another woman, ... someone older ... who just would've recognized how I was suffering and that I was different and just would've given me any kind of guidance . . . and said, 'you know, your family's like this, but you have some depth to you,' or something to encourage me . . .

Helping girls and women know who they are should be a legitimate area of curriculum just as other subjects like math and English. Being in touch with who one is may be the first and most crucial step in learning how to learn. It can provide an entry to developing a command of more traditional academic subjects.

Building a Positive Body Image. While the information presented earlier suggests one context of a person's high self-esteem can influence self-esteem in another area, for several in our study a poor body image made it difficult to receive any positive affirmations from teachers or others. We see body image as related to developing an inner self-identity as proposed already, but found body image to be so central it demands special attention.

Many of the participants in the present study noted body image as a primary factor in lower self-esteem, particularly in younger years. The specific sources of dissatisfaction varied from weight concerns, to health problems, physical scars or disabilities, self-consciousness at puberty, sexuality, social comparisons regarding beauty, and inadequate wardrobes.

The work on developing a strong inner sense of self would help to combat what seemed to be most detrimental in body image -- being compared to others, whether it be a twin sister, an older sister, a friend, a fashion model, and/or another racial group. Many of these comparisons were not self-induced but stated by parents, teachers, boys, etc. This suggests educational programs on body issues for girls and women are needed for people interacting with them, too. Women of color in this study noted that the predominant white female norms of beauty are particularly detrimental to them, and that specific beauty issues may be different according to one's culture. For example, Maya said:

> We [African American women] care about how we look. I know I care about how I look. Good hygiene and care is important. But this weight thing -- I don't like that so well. Not too many African American women are into that [obsession with weight]. I am happy with who I am.

Perhaps cross-cultural curriculum could be used to help students see there is more than one model of beauty and to encourage them to develop their own model.

Curriculum regarding marginalized groups. Talking to our interviewees showed the needs of groups on the margin are not adequately considered in education. Racism in schools seemed to be an issue for all the women of color; other groups that often felt marginalized were people of lower economic classes, non-traditional age students, shy, unpopular students, and people who were physically challenged.

Most of the racism was not blatant, but all the African-American women reported an underlying current of it in school that affected self-esteem by reminding them they were a marked group. Tara said,

> A lot of times, you know, say if there was a fight between a white student and a black student, it would always be the black student that ended up getting in trouble. Regardless of who started it or what happened or how it happened, it was always the black student that ended up getting in trouble...(So there was) nothing physically or outright - but it was this little type of racism.

Consequently, in the current trend toward diversity curriculum around the nation, we hope planners will continue to include programs to unlearn multiple prejudices for faculty and students, opportunities to build relationships with persons from a wide variety of backgrounds, and communication courses to help reduce stereotypical expectations and barriers due to differing self-presentation styles.

Curriculum on Communication Skills. Many women acknowledged the pain and awkwardness they felt because they were isolated from peers during adolescence or put with people they did not know in an unfamiliar school situation. Others noted the necessity to be able to speak up for their needs, or the difficulty they experienced in trying to build relationships with boys and men. Over half the participants placed great emphasis on building good relationships as a means to develop high self-esteem. Their comments led us to conclude communication course work beyond the traditional emphasis on public speaking is essential from kindergarten to graduate school. Perhaps we could call this "relationship pedagogy."

"People with high self-esteem intermingle with people easily," Van said. Shaundra said, "A person with high self-esteem is communicative in relationships." The women interviewed made a distinction however, between living for others, and the ability to give because one is not absorbed in self-doubt. The latter is giving out of a strong sense of self, not a lack of it.

Communication curriculum would include knowledge-building and behavioral role-playing of communication skills, such as listening, conversing with others, resolving conflicts, boundary setting, conveying one's needs to others, problem-solving, and decision-making, especially in groups. It would include education on cultural differences in conversational styles, and it would include opportunities to be with and give to others, so that students can overcome isolation. Such curriculum would work through a strength and value many girls and women hold -- connections with others.

Programming for Parents. The observations in our project suggest many parents need training in how to affirm their children more consistently and how to be gracious with their children's weaknesses. The women in our study expressed the need to give children both "roots and wings." One suggestion already noted is to create opportunities for risk-taking and decision-making; instead parents often seem focused on preventing "mistakes." Gwen said:

> Making mistakes is not bad -- what happens afterwards is the important thing. 'Can you deal with the mess you made? By doing this, you close some doors. But there are other possibilities.' Teach [them] how

> to problem solve and deal with those things; start this when they are small.

Programming also needs to be developed to help parents love their children more unconditionally, provide support, and realistically assess a child's potential in many different areas, to encourage them in those areas. One participant, Jolene noted: "Don't base your love for them on how they perform ... Don't make them measure up to something they cannot live up to." Such programming could also include teaching parents how to listen to and respect their children's emotions, perceptions, ideas, and conversations. One woman in our study explained: "Don't burst the balloon of your child's enthusiasm" and "never deny a child's experiences."

And, parents need social support, too, as they face changing social concerns. They need to know how to recognize signs that a young woman is experiencing emotional or physical challenges (e.g., eating disorders, abuse), and they need information on how to teach children about pressing issues such as puberty, sexuality, racism, and sexism.

Finally, educators need to better utilize family support as a point of entry in working to raise students' self-esteem. While several of the Caucasian women wished their parents had played a more supportive role in their lives, all the African American women cited family and church groups as central to helping them thrive in the face of a racist society. Harriott said, "I got most of my encouragement from home because when I was going to school, the counselors and teachers didn't encourage you toward college courses. You know, African Americans were not encouraged to take courses to prepare them for college. . ." So often focus is placed on the failures of African American families, but the women in this study suggest researchers need to take a closer look.

Conclusion

The initial results of this study have yielded an increased understanding of the complex, interdependent ways in which education influences self-esteem in the context of other life experiences. Issues such as discrimination, oppressive parents, a preoccupation with one's body, and shyness often kept the participants from being able to receive positive affirmations in the classroom. In fact, what happened in the classroom (good or bad) often did not seem to affect self-esteem as much as what was happening in the women's lives outside the classroom.

Thus, we conclude the most effective approach to addressing the problem of females' low self-esteem and under-achievement in school is best done through more holistic learning which recognizes the multiple social contexts impacting education, and therefore we call for a broadened definition of "formal" education. Our proposal supports some educational programs already being developed, but the women in our study showed that a multitude of other learning experiences have yet to be incorporated under "formal" education, such as living away from home for the first time, grieving a death, confronting discrimination, mentoring, and religious guidance. These are the experiences which helped some participants overcome struggles with self-esteem.

The women's comments reveal that a central way to make schools a more friendly environment for females is to make the issues women see as important equally central to the curriculum. Two such value-themes emerged from the six areas identified in our study -- the importance of internal sources of self-esteem (as opposed to relying solely on external sources), and the importance of building healthy relationships. Girls and women need coping skills for dealing with the outside world, especially as they begin to learn the precarious balancing act of taking care of themselves while caring for others, as women in the study noted repeatedly. The curriculum areas identified in this paper seem to serve both values and may help students see these not as competing needs, but as interdependent and equally important values in the development of positive self-esteem.

The ideas presented in this paper are conceptual ones. Our hope is that others can use this thought piece to provide guidance in the development of specific ways to incorporate these recommendations into educational systems. In short, we are excited! We hear the stories of the women in our study, see where each one came from, and are enabled to offer hope for the generation to come.

Women, Authority, Pedagogy and Violence

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Themes which have been built up at a certain moment during history . . . this so-called evidence can be criticized and destroyed. To change something in the minds of people - that's the role of an intellectual (Foucault, cited in Ball, 1990, p. 2).

The evidence I seek to criticize and destroy is buried in a traditional mindset connecting authority to pedagogy. In this paper, I focus on the role of women administrators in correcting the violence done by authoritative pedagogical practices and on the important role women must play in "changing something in the minds of the people".

Role models, social order, and authoritarianism

When men run the schools and women work in them, we tell boys that they will be bosses and girls that they will be subordinates - before we have even opened a textbook. When we accept standard ways of administering schools we reinforce the dominance and subordination structure which remains the basis of our social ordering. We reinforce the status quo in which men are "heads" of households and bosses of companies and all the underlying power hierarchies that that arrangement represents.

As an alternative to the entrenchment of the present social order, some jurisdictions are working toward ensuring that women hold at least half of the administrative positions. This would do more than serve as modeling for a more egalitarian future, it would also allow women an opportunity to redefine the school culture. Women in leadership roles model could model an alternative more inclusive way to order society.

This is not a new suggestion. We have all read the AAUW's report, How Schools Shortchange Girls (Wellesley College Center for Research on Women, 1992) which pulled women's issues in education into focus and leveled accusations of neglect and bias at the American school system. An important issue in that report was the dearth of women in positions of authority. In the history of education we do not have to look far for evidence of power imbalance. Shakeshaft's (1989) work reminds us of our chilly beginnings, when male teachers were making $23.10 a month while women were pulling in $6.49 - when men were called "professor" and women "miss" and when teacher's colleges were made up of "students" and "females" (p. 26).

Educational administration has a short history but some would argue that its very inception was based on power differentials. Blackmore (1989), for example, suggested that the separation of the roles of administrator and teacher early in the 1900's was not just an attempt to emulate the scientific management theories of the day but was an excuse to give male teachers an added measure of authority as well as someone to be in authority over. Men came "naturally" to the role of administrator; women were not even considered. Such blatantly sexist staffing of a publicly funded school system could only exist in a society so completely grounded in gender discrimination as to be totally accepting of it. Structural reinforcement of male authority was deemed so natural that it was accepted as the norm, thus perpetuating the culturally imbedded assumptions of male supremacy it was based on. As Blackmore (1989) would suggest:

> The gendered and hierarchical distinction between administration and teaching as categories of work based on expertise, rather than as inextricably dependent . . . reinforce(s) existing power relations and the ways in which femininity and masculinity are socially constructed and reproduced in schools (p. 109).

Jones (1993) pointed out that our society was once based on the obedience and control associated with the divine right of kings. European based forms of government evolved from a structure which required obligations of rank in both governance and religion. Family structures were founded on the same principles: if men were to "rule" their "castles", women and children would have to be subservient.

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The revolutions of the past century changed all that - at least for men. The ideals of universal suffrage, independence and free speech forced a radical change in our governing structures as we adopted various forms of democracy. But this freedom from the chain of command was not extended to include our offices, our schools, our churches, or our homes. On the one hand we aspire to democratic principles and individual rights; on the other we demand compliance from workers (teachers), women and children. Although society has progressed beyond obedience and control in governance the domination and subordination rituals remain in all other areas. As Brookes (1992) suggests:

> Until women can reclaim and know authority, men will continue to abuse and victimize us and we will continue to please and follow men. Our society is organized to make it so (p. 31).

Women may already be changing the relationship between authority and the principalship. These changes may be a signal for changes in other interactions, particularly in our responses to children. Children are learning their dominance and submission roles through us. By changing the daily transactions in the schools we can remove support from existing structures and discourage the re-enactment of our own mistakes in their futures.

The Violence of Authoritarian Structures

When women achieve equity with their male counterparts and assume administrative roles, they can then begin to change the relationship between students and authorities. In some aberration of good intentions for personal development, education is often subverted by the need to control students in order to preserve a safe learning environment. Children have long been trained in obedience and acceptance of authority as one of the basics. Now that we are beginning to understand and identify the links between domination and societal violence, our schools must take responsibility for their role in maintaining the status quo by force.

Alice Miller (1990a, 1990b, 1990c) has advanced a passionate philosophical argument against authoritarian processes in child rearing. She argues that as long as we inflict punishment on children "for their own good" (1990b) we destroy their sense of self and their innate belief in their own worth. The worst part of this process - and this is the key to her argument - is that the punishment itself destroys the child's mechanism for understanding that such punishment is wrong. Children - afraid to doubt or question their parents (or teachers) - are disallowed their anger and internalize the abuse as being (a) something that they deserved and (b) something that loving parents (or teachers) must do to children. Thus, when they themselves attain positions of authority, they have a wellspring of anger and righteousness to fuel their treatment of their subordinates, and so the cycle is perpetuated. They grow up to believe that punishment is not only right but necessary.

Amid the continuing legal and moral battles over corporal punishment, Miller suggests that adults who hit children do it in response to their own unresolved anger. The children, on the other hand, forbidden to show aggression toward their parents and teachers, internalize the anger which will eventually be recycled in their treatment of others. This perception of the origins of violence has been taken a step further by Stettbacher (1991) who feels that criminal behavior is the delayed result of bottled up childhood aggression:

> Biographies of criminals . . . give us plenty of information on the origin of criminal behavior . . . If parents fail to respect and satisfy their children's needs, their sons and daughters will later transfer their claim to other people and institutions. Using violence or manipulation they will attempt to force the world at large to respect and satisfy their, by now perverted, needs (p. 107-108).

School authorities who condone a certain amount of violence as being necessary for controlling children are confirming their students' perceptions that "might is right" and will, in turn, precipitate various acts of rebellion (Gordon, 1974). Negative experiences with power relationships may encourage young people, especially boys, to seek to re-establish dominance through violence. Authoritarian disciplinary tactics may prevent disruptions for the time being, but they are likely to result in future problems for both the child and his or her future victims.

Gordon (1974) has long advocated the use of democracy and respect when dealing with school children. In his view, "teacher power", or authoritarian methods of dealing with students, is not only injurious to them, but also to the teachers using it. Children controlled in this manner become people who rely on authoritarian power and expect to be controlled by it. Our principals' offices are full of these children, waiting for one more confrontation in a series of battles that they will never win:

> Students who use power are just as liable to be corrupted. They are likely to become tyrants, and, in their tyranny, disrespectors of the feelings, needs, and property of others . . . It is terribly difficult to feel kindly toward these youngsters (Gordon, 1974, pp. 212).

One of the barriers which has traditionally kept women out of administration has been the widely held view that a woman could not "do" discipline. Children used to obeying through fear of punishment are more difficult to direct through other means; yet many women who have chosen not to use authoritative methods have been able to "control" their classrooms. They have learned to use inclusive problem-solving approaches to address behavior through causes and consequences. Be it by respect, humour, understanding or inventiveness, they have been able to win over unruly students enough to make a real difference in many lives. Unfortunately, these people have always been in a minority. It is a modern irony that although many school boards have forbidden the use of corporal punishment in their schools, they have persisted in hiring principals who could administer such punishment should it become necessary.

As Miller (1990c) would say, it is not too late to start the healing process - but we would have to change our existing educational patterns. The school and other social institutions could be instrumental in helping children come to terms with their anger and their unresolved feelings to enable them to become more effective adults:

> When the anger of early childhood and the ensuing grief have been experienced, affirmative feelings, which are not based on denial or feelings of duty or guilt, can emerge of their own accord, assuming the right preconditions are present (Miller, 1990c, p. 23).

It is in the provision of the "right preconditions" that women administrators can make their most important contribution. They could change attitudes toward children and allow schools to build strong, courageous, supportive people in place of the controllers and the controlled. The day to day integration of intellectual and affective development will be the real challenge for meeting the needs of students. This would require a whole different view of pedagogy.

Pedagogy and the new social order

> It is a mistake to suppose that education alone can solve this world's problems. Yet if there is to be hope of the continuation of life on earth, let alone of a good life for all, as educators we must strive to do more than join mind and body, head and hand, thought and action (Martins, 1994, p. 403).

How can schools combat the fragmentation of alienated feelings and unresolved abuses of power and hope to build honest equitable relationships between adults and children, men and women? Cooperative learning, holistic language acquisition, variety in teaching strategies, affective connections in skill building - all philosophically connected to teacher and student empowerment, are already fighting for a place on the curriculum. Women administrators are often linked to these changes and could become instrumental in changing how schooling and society address the challenges of education.

Basic to this changing view of children and child rearing practices is a revised view of education itself which has sometimes been dubbed "feminist pedagogy" although I would prefer to call it inclusive pedagogy. What sets "inclusive" pedagogy apart from the others is (a) a belief in the importance of the affective (b) a conviction that true education must include recognition and analysis of dominance and submission in social structures and

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(c) the recognition of the personal effects of child abuse on all children. Inclusive pedagogy, then, places emphasis on the importance of emotions, feelings, and personal responses. Brookes (1992) argued that the lack of the affective in our schools teaches children to mask their feelings and disown their emotions:

> I had not been taught to critique the world as it appeared to me. Instead, years of uncritical, rote learning had taught me how not to know (p. 2).

Besides including the affective in education, inclusive pedagogy insists that education should facilitate the personalized interpretation of life experiences to enable students to recognize and deal with abuse, injustice and inequality. Although Brookes (1992) intended this approach to help females to come to grips with male domination, it could also be applied to young men dealing with the lack of opportunity to express emotion in their lives and the childhood traumas associated with power and control. Boys could also benefit from learning how to express and understand inequities in power structures. As Steinem (1992) pointed out: "Since men are more likely to respond to past abuse by abusing others, our prisons are full of those who continued to do to others what was done to them" (p. 79). Young men and women are equally at risk of being adversely affected by the structural social inequities imbedded in our culture. The difference is that young women tend to express their hidden rage in damage to themselves while young men tend to take it out in damage to others. The school system could provide the vital link in addressing these destructive tendencies. Try this passage without the words in italics:

> Relations of power can work to produce the well-kept secret of *male* violence *against women*. It is a terrible violence. And it is reproduced through schooling practices . . . which work only too well to reinforce feelings of fear, inadequacy and contempt - teaching us that it is not nice, not scholarly and certainly not scientific to speak of the personal in an academic context (Brookes, 1992, p. 10, italics added).

The "autobiographical approach" advocated by Brookes (1992) is just one of many techniques used in feminist pedagogy. It embraces practices which emphasize the shift from the importance of content to the importance of process. It would include activities in which students learned to value their own feelings - and those of others, and processes in which students were invited to problem solve and create rather than memorize and manipulate. Weaving through the theory are notions of voice and active learning and a linking of the affective with the cognitive.

Inclusive pedagogy practices might include peer editing, life writing, letter writing, deconstruction exercises, role playing, dramatic re-enactments, and class logs. The techniques used are not as important as a risk-free environment in which half-formulated thoughts can be aired, accepted and honed into meaning without fear of derision. Learnings currently valued in the schools are not necessarily good for individuals. Inclusive teaching practices could lead to a repositioning of society's values. Without that repositioning, teachers will continue to teach in the ways that they have been taught and therefore, carry on the oppression of our children. The adoption of such a pedagogy would require a rethinking of basic beliefs about education from a "problematic" stance - a questioning of accepted "truths" in light of the societal assumptions which have allowed them to survive.

This rethinking is already going on. Martin (1994), for example, suggested that educators might rethink the need for subjects and disciplines. Rather than argue about which subjects should be taught, she suggested an examination of the whole concept of "subjects"(p. 188). Noddings' (1992) answer would be "caring". She suggests a new curriculum in which "caring" is applied to all elements of learning.

These new ideas demand a rethinking of the old, many of which have come to be held quite sacred. A reassessment of Maslow's Hierarchy of needs might encourage us to spend more time on "belonging" and a lot less on individual accomplishments. The standard learning curve is still taught in many teacher education institutions and remains the foundation for standardized testing. If we were to question the mathematical probability of finding a small percent of our students to be brilliant and an equal number lacking in intellectual capacity we would also question the value of standardized tests:

> Through surveillance, observation, and classification (we) normalize children but do not seem to acknowledge or even understand the point that the developing child is an 'object' produced by those very same practices (Ball, 1990, p. 12).

Basic to a re-examination of our school practices would be a revised definition of learning. Perry (1970) described the transition in terms of attitudes toward learning. Ideally, in Perry's model, an advanced understanding of knowledge would recognize it to be a life skill to be applied to personal and professional problem solving. There are different kinds of knowledge for different contexts: no absolute truths or complete answers. The learner's task would be to identify the issues and seek the solutions according to the situation, expecting both negative and positive feedback from the teacher to help improve problem solving skills.

In Freire's "liberating pedagogy" the teacher and the student are expected to learn simultaneously - through dialogue, reflection, and action along with humility, faith, hope and communion. For Freire, content is secondary to dialogue - with students and teachers "together seeking reality". Revolution, authentic revolution, would end the dehumanizing effect of schooling.

Freire's (1970) work links with Alice Miller's (1990b) concern that many children grow up not realizing that the abuse they suffered was not necessary or normal. Freire identified the problem as lack of recognition. He argued that we have accepted the oppression as necessary and even helpful, and have made ourselves incapable of the critical evaluation process which would be necessary to set us free:

> How can the oppressed, as divided, inauthentic beings, participate in developing the pedagogy of their liberation? Only as they discover themselves to be hosts of the oppressor can they contribute to the midwifery of their liberating pedagogy (Freire, 1970, p. 33)

The changes toward "inclusive" pedagogy are being undertaken by individuals working in isolated contexts to make their classrooms more inclusive. These isolated attempts are often smothered by outside structures unable to accommodate the changed philosophy. For example, one teacher reported extremely high grades for all of her students who, after failing out of the regular Grade 9 mathematics program, undertook a contract in which they committed themselves to group processes and to each other, with the goal of achieving mastery learning. The resulting A^{+}'s on the report cards upset the regular mathematics teacher, the other students, the parents and the administration. The teacher was called to task and accused of various unprofessional practices while the students were accused of cheating. The treatment of the situation by the administrator was an important factor in the individual teacher's decisions to challenge the status quo. A changed role for administrators would be necessary in order to create an environment in which alternative pedagogy could flourish.

Such a change could enable students to come to terms with important personal issues in their lives and allow them to apply their critical thinking perspectives later to their own adult lives. It is to this end that women and men can rededicate themselves to true growth and learning for all students and work toward democracy and equality for all people. Equal numbers of men and women in positions of added responsibility would be a positive first step.

Conclusions

It has been argued that women should occupy positions of added responsibility in equal numbers with men because their presence would serve to change societal expectations for the dominant-subservient positions of men and women, and encourage a changed view of authority. This would encourage societal changes in attitudes toward discipline, punishment, and the treatment of young people - especially those who may be responding in negative ways to abuses of authority in their own lives. This would require a rethinking of education and an application of inclusive pedagogy intended to allow students to connect with their personal emotions, understand the dynamics of power and abuses of power, develop personal goals and challenges and be encouraged in their abilities to relate to other people and use group processes in problem solving.

The argument presented here places women (or other non-authoritarian administrators) at the centre of a revised notion of education and society. Miller's view of traditional child rearing practices as institutionalized abuse connects violence to the issues of domination and authority. Brookes' takes the sense of institutionalized dominance into her arguments in support of "feminist pedagogy". Both of these views find their home in postmodern theoretical examinations of existing societal structures and individualized responses to them. Making the connection between authority and violence helps us to understand the "incorrigible" among us. Changing our fixation on control and replacing it with empathy would go a long way toward making our school systems more beneficial places for everyone.

The role of women in this transformation is multifold. First, the mere presence of women in positions of added responsibility challenges the expectation that men will lead and women will follow and models the changing expectations for mutuality and respect. Women as administrators would then be free to challenge the traditional authoritarian values embedded in the school system and work toward replacing them with inclusive pedagogy based on personal worth, dignity and respect. These revised pedagogies would furnish students with the tools that they need to become in touch with their own emotions and to develop critical thinking skills, social and interpersonal skills, and problem solving abilities. Then the real education process could begin - for all of us.

> *In rebellion alone, woman is at ease, stamping out both prejudices and sufferings; all intellectual women will sooner or later rise in rebellion.*
> *- Louise Mitchell, 1890.*

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Making the University a more Equitable Place: Stories and Strategies

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One day last fall a call for papers landed on my desk asking for **Success Stories in Feminising Canadian Institutions**. At first I thought it was a joke - is there such a thing as a "feminised" institution? But before I could throw it in the garbage, the phone rang. It was a Women's Studies Advisory Committee member who had just come from a university senate meeting where the following motion had been passed:

> Moved that the Senate direct the academic leaders (Chairs, Deans of Faculties, School Directors, Department Heads) to report back to Senate, on their actions in their respective academic units on raising the awareness level of their peer colleagues on the issues concerning continuing Women Canada Scholars and women in science generally.

This sounds like a powerful pronouncement of commitment to equity, but, as you probably know, shows of support cannot necessarily be taken at face value. In this case, the motion was passed only because it was late and most of the senate had gone home. And, to waylay the mass migration to join us on our "feminised" campus, I hasten to add that this pronouncement had very little affect. Although we called an emergency meeting to organize ourselves to handle the inundation of requests for information, such an avalanche of interest did not materialize. We prepared a nice package for departments to use in their "sensitizing" processes but we haven't had to go into extra reprints. However, it did buoy me up long enough to get me involved in documenting our "success".

Stories: The University's New Clothes

In order to respond to the call for **Success Stories in Feminising Canadian Institutions** I was forced to take liberties with the words "success" and "feminising". The word "success" implies completion - measurable gains, job done, banners unfurled. Our progress has been a series of small, sometimes seemingly insignificant progressions. Yes, there are successes, but the "feminisation" is by no means complete or even within our sights.

In response to that call for papers, I circulated a survey among women faculty (50 out of 350 faculty). These women were asked to describe (a) individual attempts to make the university more welcoming for women, (b) combined attempts among several individuals to address an issue and (c) additional or special programs. Participants were also asked to describe any incidents in which they felt "blocked" in their attempts at "feminising" some part of the institution.

To convey the results I use the feminine metaphor of clothing, tracing the gradual introduction of feminism to the university's wardrobe. This is not to say that the "feminisation" of our institution was ever a stated goal. We did not come together with such an objective in mind. In fact, our coming together is a part of the "feminisation" story. As each of us worked quietly on her own personal battle, we found our paths crossing and individual voices becoming louder through our collective pressuring of boundaries. Without actually stating it, we were struggling toward a collective goal.

These "feminising" processes have been going on simultaneously, often in curious isolation. I suspect that this is the way it has been in many places and that a similar series of events has probably been happening at other institutions in much the same fashion. We must be careful not trade our old clothes for another uniform or an ill-fitting one-size-fits all garment. Our new clothes must be unisex, confortable for all regardless of gender.

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Our moves toward an equitable institution started with threads - individual attempts which added little twists of color to the overwhelmingly masculine fabrics of our existence. Collaboration on various projects provided patches for the portions of the garment most in need of repair. Eventually we could hope to create whole items of clothing to replace our university's aging garments with fresh materials more suited to the modern world.

Threads

The recent change was one of critical mass rather than sudden awareness. Gradually, over the past few years, two things started to happen on our campus: there were more women and women in general became increasingly intent on doing something about equity. The "old-timers" had been doing the ground work, quietly, year after year, in their own way, in their own spheres. Now, these people were getting support. The status of women group, for example, in place since 1986, suddenly had a more robust membership. The years of chipping away at the collective consciousness were beginning to show and feminist research was finally filtering into mainstream thought.

A good starting point was the equity efforts which ensured processes for encouraging the hiring of women. Once hired, women were supported by equity representatives appointed to sit on tenure and review committees. This made a difference as more women were promoted more women had more status. Also, new harassment policies combined with renewed societal awareness of individual rights. This contributed to a gradual change in attitudes which has made some parts of the working environment more congenial for women. Some departments responded to the needs of women faculty with small children and re-arranged schedules. Some individual women were granted educational leave to complete doctorates. All of these systemic changes have been small, and slow, but they have made a difference.

This is not to say that the chilly climate has somehow suddenly melted away. Each of us could tell a separate horror story - the big stories about the women who have been forced out of tenure track positions. or about those fighting to maintain research funds in the face of complete lack of support in their home departments. Or we could dwell on the thousands of small things - the librarian unwilling to stock more of those "feminist" books, the jibes in faculty meetings; the quiet sabotage of individual endeavors and subtle disregard of women's issues. But this is a success story; the setbacks must wait to be reported at another time.

Let us dwell on the new environment of hope. Does the fight by one dean to get feminine hygiene products placed in the washrooms count as a major victory? Perhaps not, but there were other victories which were more public and therefore more celebratable. Each small victory has had its price and its story. For example, last year a masters course on race and gender in education was offered. When the class was first proposed four years ago, it was turned down at the department level. Years went by, department heads changed, a new female chair added the class to the special topics list. One small thread in the cloth of change.

Meanwhile, teaching strategies have been changing. When some of us attended a Feminist Pedagogy conference we were srupised to find out that there were names for the unorthodox methods that we had been using. Although we had, at times, been ridiculed for "deviant" practice and, in some cases, asked to account for our marking practices, at this conference we found our secret deviances condoned and even extolled under the rubric of "feminist pedagogy". This lead to several small inroads. We wrote an article about the conference and published it in the university's "teaching" publication. Then we started a small study group to examine the realities of "feminist pedagogy" and its application to teaching in our various fields. Eventually we began to make formal liaisons with groups of professors to attempt to institutionalize the feminist practices on campus - to add some color to the fabric.

Patches

Some of these small threads eventually became patches . For example, the Committee on the Status of Women has been promoting women's issues through invited speakers for nearly 20 years. More recently the Women's Studies Advisory Committee augmented this with a series of research based seminars.

One attempt at patching was a mentoring project intended to connect new faculty with senior people so that they could be "shown the ropes" and benefit from other peoples' experiences. In theory, this was a very good idea. In reality, we were overwhelmed by an ironic problem. At the time there were only 3 or 4 female full professors. Most of the rest of us had fewer than 5 years of experience. This meant that we could ask the full professors to mentor about 10 people each or we could ask women with little experience to serve as mentors when what they wanted was to be mentored. We compromised and had a few gatherings as a group to discuss issues and share concerns.

A major patch in our story was the development of a women's studies program which was based shakily in place in 1991. Individuals from all over campus formed a Women's Studies Advisory Committee and we started with a first year course. Each year we added another level. Meanwhile, we cooperated with other departments to develop or designate courses cross listed with other departments to allow students to earn a women's studies minor. More recently we have started a collaborative Master's program, in which students can enroll for a master's degree in Education, Sociology, Social Work or History and also earn a women's studies specialization.

Sometimes we are amazed at our own energy. Where did we get the idea to set up a Women's Studies Research Centre? This "patch" is still being woven and we have not actually found a place on the garment for it . . .

The recent focal point of our development grew out of yet another initiative that had its curious beginnings in the student services department. Our university has been a part of the Canada Scholars Program since 1988. In order to maintain their scholarships, students must maintain A averages. The student services department noticed that the female scholars' retention rate was very low so they enlisted the help of some researchers to examine the situation. This lead to a series of focus groups with students and professors in the sciences to try to determine why female scholars were dropping out. When this research was reported to the university senate, it was picked up by male members of senate who introduced the supportive motion already mentioned.

At this point, we could rely on another "patch" for help. The Gender Issues Centre, funded by the student union, had been providing resources, referrals and assistance for all students since 1991. Its' staff was able to provide a list of recommended videos and books to aid in the faculty education process.

Is this the feminisation of an institution? I think not. We have woven some threads, we have replaced some fabric, we have even added accents to the ensemble, but we have changed little about the foundation garment. However, through the focus groups and through other research, we have been able to develop something of a 'wish list' - some simple things that would make the university environment more inviting for women students. This would, in turn, make the univsersity more of an equitable place for all women.

Strategies: Policy is only a beginning

On first glance, our university would appear to be an inclusive place. With each advertisement for a new position our institution is advertised as an equal opportunity employer. We have a women's studies program at both the undergraduate and graduate levels, a Women's Studies Research Centre, an excellent harrassment policy, a gender issues centre, a gay and lesbians centre, and the requirement that there be an equity advisor on all promotion and tenure committees.

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Some students in the focus groups felt that some parts of the university were already recognizing women's needs. Many had had the opportunity to take courses of special interest to women such as women's studies courses and others had found that women's issues were being included in "regular" course work. (We had little trouble identify the classes these students had taken to get that "inclusive" impression.)

Women students were especially appreciative of exposure to qualitative research methods. Although this was not happening very much in the hard sciences, it was becoming common in the social sciences and humanities. They also appreciated the opportunity to work with women professors. Many had not reflected on the gender of their professors until they were asked that question. A common response from science students was, "I've never had one woman professor in my entire time here" but in other departments, there had been more women professors.

In spite of the official attempts at inclusion, there were many students who had experienced elements of a chilly climate. One girl in engineering for example, had been asked not to wear a skirt to class as it "distracted" her classmates. Another in the same program was told that the summer job she got should have gone to one of the male students who really needed it. Women in the hard sciences felt isolated, had trouble forming study groups and found that there were some places where they felt unwelcome and even unsafe.

Tranformation of the university's wardrobe would make it a less chilly place. Students at both the undergraduate and graduate levels gave us advice on what they thought we could do to "feminise" the university. Their suggestions for further improvement reflect the issues that many of us have long advocated:

1. Incorporate women's issues as a component of existing courses so that all students, male and female, can be exposed to them.
2. Include, in course content, more research about and by women and about contributions made by women's ways of thinking.
3. Make special courses on women's issues available.
4. Use alternate methods of teaching: role playing, case studies, visiting female practitioners, special seminars, panel discussions, and/or speaker series to augment course content.
5. Provide for networking and mentoring. Encourage a network of contacts and encourage formal and informal mentorships. Students could "shadow" practitioners.or go through the program with a cohort of other students and/or be matched with senior graduate students who could provide information about classes and job opportunities.
6. Use innovative scheduling to improve access. There could be more flexible deadlines, relaxed residency requirements, or arrangements made to allow time off regular jobs to attend classes. Alternate delivery methods such as teleconferences and off campus courses would reduce the need to commute.
7. Provide daycare and financial aid to encourage women to take the full-time programs.
8. Employ more female professors to provide more role models, and demonstrate equality. Female professors should be, to quote the students: "women-affirmative, but not necessarily aggressive" or "career women - mothers who can appreciate how difficult it is to juggle both a career and a family", not those who have "bought into the traditional way of being and doing".
9. Provide "awareness opportunities" for male instructors such as "seminars, similar to cross cultural training". Professors could also be trained in teaching adult learners.

This last point was most important to all groups of students. Although the university had done what it could to make sure that policies and practices were affirming, the stated policies could not prevent professors from marginalizing female students, from omitting the "female content" or from placing higher value on traditional androcentric structures. This is not to say that inclusive policies are not important. Difficult as they are to implement and impossible as they are to enforce, they are necessary foundations for change. However, policy is sometimes propaganda. They can make institutions appear to be "feminised" when they are not. The issues do not go away because someone addressed them in a policy manual.

Another risk to our continued battle is the assumption that, as the current professors age and retire, they will be replaced by more sensitive and inclusive people. Age, experience and gender have little to do with enlightenment. Our future professors are being trained in the programs of today. Without exposure to the issues, through in-class discussion of the implications of sexism, there will be little difference between the professors of today and their replacements of tomorrow. It is essential that gender issues be addressed in universities now.

The change is must come in process as well as content. Professors of either gender could do qualitative research, could use adult learning practices and could provide students with the opportunity to learn reflective processes, just as professors of either gender could chose not to do these things. It is these practices, regardless of gender, which are important. Exposure to these processes affects the way students think and could eventually have a strong impact on society.

We must not assume that what we are doing does not matter. Although on the individual level, we may feel that we are not in a position to change our institutions, we must believe that the small changes we are able to make will have a profound effect on the future. Our students are tomorrow's leaders. To neglect to expose them to notions of equality and to deprive them of the opportunity to reflect on those issues is to further discourage those willing to seek change and to put our stamp of approval on the status quo. Universities do exert influence and we have the potential to be catalysts in the change process.

The things that we have done, the small gains that we have accomplished are important (if minute) steps toward change. It is a start toward an inclusive community of professors, administrators, staff and students. A feminised institution would encourage women and men to cooperate for the growth of all people in all aspects of the educational process. It would also hear the voices of the traditionally disenfranchised and value diversity.

Is this too much to ask of our academic institutions? It is a fact that women and minorities not always treated with the same respect afforded to white males, but this is changing and we can help it to change. Let us not forget that the things we are requesting are not demands for special treatment, they are demands for equal treatment. If universities could honour those demands with a just and equitable environment for all people, they could set the tone for a just and equitable society in our future.

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GENDER AND MUSIC ADMINISTRATION IN HIGHER EDUCATION

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Introduction

It can be useful to explore questions of gender equity in higher education by examining leadership opportunities and experiences for women in particular disciplinary arenas. It can be especially enlightening when the focus is on a field thought of as traditionally hospitable to women, such as music.

There is a popular perception in higher education that women succeed best in "soft" academic areas, such as languages and the fine arts. As Aisenberg and Harrington point out in *Women of Academe*,

> The aspect of women's academic work almost universally taken as evidence of their intellectual inferiority or "softness" is their habit of choosing humane subjects - the "soft" (here synonymous with "easy") scholarly fields - in numbers strikingly disproportionate to their male colleagues. By the end of the 1970's, when women accounted for about 28 percent of the total Ph.D. recipients each year, they received 48 percent of the degrees in English, 63 percent in French, 40 percent in Psychology, 40 percent in fine and applied arts...[1]

By 1986, women were earning a majority of the doctorates in humanities areas such as English, modern languages, and art history.[2] Nonetheless, even within the humanities, the picture for women is mixed. While women in the humanities have received a share of faculty appointments proportionate to their share of new doctoral degrees, they are less likely than men to become tenured, and more likely to be hired part-time and at community colleges.[3]

Furthermore, a recent survey has shown that professors in academic fields in which women predominate are among the lowest paid faculty. Nursing, home economics, and library science are among the very lowest paid fields. Although music departments are not predominantly female, their faculty salaries are also below the average, at every rank, for both public and private four-year institutions of higher education, according to the College and University Personnel Association.[4] For example, the median salary for all ranks of music faculty was $38,787 at private colleges and $42,000 at public colleges, compared to median salaries, across all major fields, of $44,941 at private colleges and $45,951 at public institutions.[5]

Gender and Music Faculty

This study examines the relationship between gender and music program administration in higher education. The current status, demographics, career paths and perceptions of job problems of female music executives are explored. Just as faculty in traditionally female areas of study earned the lowest salaries, deans of colleges of home economics and social work earn among the lowest deans salaries at baccalaureate institutions. Deans of schools of music also rank near the bottom of the dean pay scale.[6]

Women represent approximately one-fourth of all music faculty, with fairly similar percentages in doctoral, comprehensive, baccalaureate and associate degree granting colleges and universities.[7] At the same time, women music faculty are skewed in the lower ranks. Women represent 32 percent of all assistant professors, but only 17 percent of the full professors.[8]

Table I: Percent of Music Faculty by Rank & Gender, 1993-94

Rank	% Men in @ Rank	% Women in @ Rank
Professor	37 %	23 %
Associate Professor	31	32
Assistant Professor	22	31
Instructor, Lecturer, Unranked	10	15

Source: Higher Education Arts Data Services, Data Summary, 1993-94, Music Chart 5. (184 institutions reporting; list not inclusive as some institutions did not provide data by gender.)

Another way of looking at the representation of women music faculty is illustrated in Table I. Of all women music faculty, only 23 percent hold the rank of professor, while 37 percent of all male faculty are at that rank.

Table II: Percent Music Faculty with Doctorates by Rank & Gender,1993-94

Rank	Men	Women
Professor	44 %	28 %
Associate Professor	33	36
Assistant Professor	19	33
Other	4	4

Source: Extrapolated from Higher Education Arts Data Services, Data Summary, 1993-94. 184 institutions reporting. List not inclusive as some institutions did not provide data by gender.

There are several reasons why women might be less well represented than men in senior ranks. A smaller proportion of women than men faculty have doctoral degrees. As Table II indicates, 44 percent of men but only 28 percent of women hold doctoral degrees. Another possible explanation for gender differences in rank could be differences by gender in length of service in academia. As can be seen in Table III, 57 percent of men, but only 47 percent of women, have ten or more years service.

Interestingly, 32 percent of women compared to only 24 percent of men faculty have four or less years of service. This might lead to an expectation that the proportion of music faculty who are women is increasing, but in fact, there has been very little change over the last ten years. Data from 1984-85 show that a decade ago, 22.4 percent of music faculty were women, compared to just over 25.6 percent in 1993-94.[9]

Table III: Percent of Music Faculty by Years of Service & Gender, 1993-94

Gender	1-4 Yrs Service	5-9 Yrs Service	10+ Yrs Service
Men	24 %	19 %	57 %
Women	32	21	47

Source: Extrapolated from Higher Education Arts Data Services, Data Summary, 1993-94, Music Chart 10.

Historically, salaries for women faculty have been lower than for men, throughout the academy, and across ranks. Average salaries for men full professors was $59,180 in 1991-92, for example, compared to $52,380 for women. At the associate professor level, the difference was $44,130 to $41,040, while for assistant professors it was $37,240 to $34,380.[10]

Salaries for women music faculty similarly lag those for men music faculty. Higher Education Arts Data Services (HEADS) salary data are aggregated by type of institution (public or private) and by number of music majors at the institution, so overall salary data are not available. However, for private and public institutions, at every size level, men professors, associate professors, assistant professors and instructors averaged higher salaries than women of comparable rank.[11]

Gender and Music Executives

While women are 25.6 percent of music faculty, they are only 15.7 percent of music executives. This represents a substantial increase since 1974, when women were only 6.8 percent of music executives. Within the National Association of Schools of Music (NASM), women hold 7 of the 35 leadership roles, as NASM officers, commission members and regional chairs; twenty percent. They also hold five of the eight seats on the Committee on Ethics and the Nominating Committee.[12]

In music administration, the term "music executive" encompasses positions of department head, department chair, director, and dean of music units. The chief music executive is the person holding the highest specifically music position in a college, conservatory or university. The chief music executive can therefore range from a department head to a dean, or even a president, in the case of a free-standing conservatory.

For this study, the authors interviewed 20 women chief music executives. The women music executives selected represented non-degree, two-year, baccalaureate, comprehensive and doctoral granting institutions, as well as different geographic regions across the nation. They respondents were asked 28 questions about demographic data, career path experiences and perceptions of daily work.

Findings

Of the women music executives who were interviewed, three out of four hold the doctorate. The others all had masters degrees. Overall, the women executives were older; half were 56 years of age or older. Less than a fourth were under 46 years of age. Several were assistant professors, a fourth were unranked, more than a fourth were associate professors, and 40 percent were full professors. Salaries ranged from between $30,000-39,000 to over $100,000, with most being clustered between $50,000-70,000.

Eighty-five percent of the women interviewed were white, ten percent were African- American, and five percent were Asian. While most were in their twenties or early thirties at the time of their first full time college appointment, twenty percent were in their late thirties or early forties. More than 60 percent had tenure track appointments for their first full time positions.

One of the most interesting findings, albeit not somewhat unexpected, was the career path. More than half of the women began their careers as public school music teachers. Others gave private music lessons or performed at their churches. As Susan Heald noted in "Pianos to Pedagogy," "In my case, girls who played piano became teachers, not musicians. We became music teachers, perhaps, or regular public school teachers..."[13]

Some of these women did not originally plan to work in higher education. Perhaps they were not encouraged to do so initially. Most of these women sought their advanced degrees and jobs in higher education after their children were in school. Some went back because they felt, "I can do this."

Even for those who followed a traditional academic career trajectory, going to graduate school immediately after gaining their undergraduate degree, gaining a tenure track position, and remaining continuously in higher education, family obligations affected career paths. Some followed their husbands' moves, sacrificing their own opportunities. As one women put it, "I stayed after I got married and had children, but I was less active. I became a chair when I was 45 years old. I didn't get my Ph.D., but my husband got his."

An overwhelming majority of the women got their first position as a music administrator through an internal search. This suggests that women may move into leadership positions over time, because of recognition of their leadership skills. For subsequent positions, a majority applied or were nominated for external searches. They had served in one or another music administrative positions for as few as two years and as long as 17 years. The mean was nine years of service.

There was a remarkable degree of similarity to what they believe are the best and the most difficult aspects of their jobs as music executives. Most like the people they work with, and enjoy seeing their students succeed and grow professionally. They feel they help make good things happen and relish the problem-solving demanded by their positions. They believe in music education, and they love the product. "Just being involved in the art of making music sustains one, in spite of problems," as one executive said.

The most difficult aspects of the job were time, complexity, personnel issues and lack of support. Almost all respondents cited the lack of "enough time to do it all." Managing music departments is complex, because of the need to recruit so much personnel, performance scheduling and planning. As one person put it, "I have chaired Music and Humanities. Music is so much more time consuming."

Personnel issues included managing group dynamics, such as getting people to work cooperatively. The lack of support came up time and again. Person after person cited the lack of administrative support of, or understanding of music departments and schools. One faces a "constant cyclical need to justify the profession." Another must "fight with administration to rationalize the music program's existence" all the time.

Things they would change about their jobs include having more time, more support staff, more autonomy or more financial resources. More time and more help were the most frequent responses. "I need support staff to help with fundraising. I have to do it all myself." Another said, "I need time to formulate plans and more autonomy to carry plans out. It is wonderful to dream, but hard to get others to listen." Interestingly, the need for time was to better administer their units, not to enhance their own research agendas or careers.

Questioned as to what best prepared them for administration, some women said they had good "people skills." Some said that being a parent had been good training. Several pointed to their experiences in public schools. "If you can manage a junior high music class, you can handle a music faculty," one responded.

Their biggest disappointments, perhaps reflective of their high levels of personal productivity, were "faculty who do not produce." Others disappointments involved "dealing with selfish, uncooperative faculty," and "the inability of senior administrators to have the same vision we do."

Gender and Music Administration

There is good news and bad news about gender ,in the experiences of women music executives. The good news is that most believe that gender made no difference in their selection as chief music executives. Some also felt that being a woman either made no difference in their job, or made it easier for them. As for the selection process, some said that people are paying attention now to women. One noted that initially, it was easier for her to be selected, because the men in her department viewed her as being unthreatening, "but when I started making decisions I became a threat."

Some of the women felt that the job was easier to handle because they were women. One said that women are more open to problem solving. Another said women are more self-sacrificing. Others felt it was harder for women. Some faced dilemmas about whether to be tough or tender. "People want nurturing women. When you have to go hard, they tend to view you as a bitch, rather than an authority." Half of the women said being a women didn't make any difference in terms of making the job harder or easier.

While more than a third of the women said that they did not have job problems that were related to gender, in fact most of the women related such problems during the interviews. "I'm given less respect because I'm a woman,"one said. "Senior administrators response to my assertiveness was patronizing and hurtful," another responded. Others pointed out that older male faculty members, former chairs, and some male senior administrators had real problems with women in positions of authority. Some experienced being ignored by physical plant workers, or having older male faculty members who "won't set foot in my office."

Asked to suggest policy changes that institutions could make that would make it easier for a woman to be an effective music administrator, most had few recommendations. Search guidelines have helped, some say. Policies need to be clear, so that politics is reduced. "The urinal in the dean's office should be replaced with a regular toilet," said one interviewee. "Training helps," said another. Several remarked that the national accrediting society is very powerful and very male. "A real old boys' network," two different administrators remarked. One woman noted that, "There are policies and there are attitudes. Changing attitudes would help."

Summary

Women do not yet hold a share of music executive positions equal to their representation among music faculty. From those women who do hold positions of leadership, however, there is some positive feedback. There has been a significant increase in the proportion of music executive positions held by women, over the past 20 years. For some women in administrative positions, gender problems still abound, but for others, the problems have diminished over time. "I dodn't have any gender problem more than once. I have a no-nonsense approach," one woman related. "For example, a colleague called me 'Babe'. Once. Another time, a plant worker ignored me and talked only to my male colleague. But I have seen to it that there are no repeats."

"I only had problems the first few years," another woman said. That seems to appropriately summarize women's experiences in music administration. Women got there by sometimes circuitous routes. Many had not expected to have careers in higher education, or to be music executives. There successes were serendipitous, due to the emergence of their skills, rather than being planned. They feel that they work extremely hard, and are disappointed when others do not share or live up to the high expectations they hold for themselves. It often took them a long time to become administrators. At first, some had problems due to gender. Now, most reported, the problems are less evident and more subtle.

Women are still underrepresented in music administration. Some gender discrimination still exists. But for many women, the problems of bias have been reasonably overcome. The problems that remain for them involve a need for adequate time and more understanding of their discipline.

Endnotes

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HOW LONG YA'IN FOR?

THE USE AND ABUSE OF WOMEN IN GRADUATE SCHOOL

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Is there truly is a crisis of feminism, or is this simply a media creation? There is a tremendous gap in the literature about why women do or do not define themselves as feminists, and what that identification does for women as a tool to help them cope with the obvious rigors of graduate school. I filled the gap by extensively interviewing sixty-five women graduate students at USC. In addition, what is not clear from all of the recent articles on this topic, is how closely the "non-feminists" resemble the "feminists" in terms of their opinions about the equality between men and women in the workplace. Both groups of women agree that men and women should be treated equally in terms of pay, promotion and hiring, but only feminists tend to see themselves as part of a larger whole, a part of all women. Non-feminists are really individualist in their outlooks in graduate school, and in their lives.

Why is it that some women experience graduate school as a crisis of gender inequality, while other women do not genderize their experiences in this manner? Graduate school is difficult for men as well as women, but is there something in the oppressive graduate school milieu which is especially noxious to women? And which women, feminists or non-feminists would be more likely to feel that graduate school is particularly offensive to women, thereby making them more likely to feel a sense of alienation? I assumed that since non-feminists do not tend to align themselves with a group, that they would be more likely to feel alienated while in graduate school. However, I found that the feminists were much more likely to feel alienation in the forms of powerlessness and meaninglessness than were the non-feminists. What then is the function of feminism for women graduate students? Might some women graduate students define themselves as feminists in an attempt to use feminism as an empowering force to help them deal with the strain of graduate school, while others might use feminism to conceptualize their seeming failure to conquer the male bastions of academia as a manifestation of women's oppression? Since completing the Graduate Women's Survey in 1986, I was shocked by how many women reported being sexually harassed while in graduate school. Fully twenty percent of the women surveyed either had been, or knew of someone who had been sexually harassed at USC. This study prompted me to delve deeper among USC graduate women to understand their opinions and experiences in graduate school. Using structured and unstructured interviews, I obtained a large amount of data about women's attitudes toward feminism, their experiences with sexual harassment and discrimination while at USC, and whether or not they felt alienation in the forms of powerlessness and meaninglessness while in graduate school.

I based my study on the results of sixty-five interviews with women graduate students at USC. I was particularly interested in finding out whether women in traditionally male fields felt relatively more powerlessness as compared to women in traditionally feminine fields, and how feminism fit into their lives. Of the sixty-five women interviewed, thirty-nine defined themselves as feminists, while twenty-six did not define themselves as feminists. The classifications of "feminist" and "non-feminist" are based upon the women graduate student self-classification, and include considerable overlap of ideology and opinions. The interviews lasted anywhere from one to six hours. Many women (mostly the feminists) described, often in great detail, their experiences with sexual harassment, discrimination, powerlessness, meaninglessness, loneliness, and general abuse while in graduate school. Women in various departments emphasized to me during their interviews that it was wonderful to sit and talk about women's experiences at USC. Just spending the hours of the interview talking made these women, non-feminists and feminists, and myself, feel a sense of connection to one another, a recognition that, "I'm not alone in my feelings," and most importantly, "I'm not crazy." I wanted desperately to get all of these women in a room, pour everyone a glass of wine, and just sit and talk for hours about our shared experiences.

GRADUATE SCHOOL AS A CRISIS OF GENDER INEQUALITY

Both the non-feminists and the feminists experienced a shocking amount of sexual harassment and discrimination at the hands of faculty, staff, and male graduate students, but only the feminists tended to internalize these events in the forms of powerlessness and meaninglessness. It is clear from my study that women in graduate school have a difficult time making it, not only in their coursework, but also avoiding sexist professors and colleagues. The non-feminist women reported discrimination against them in a number of areas including: the men in their programs being seen as more serious students, appearances of women being seen as more important than their work, and simply being ignored. They insisted that their experiences were individual in nature however, and were not likely to feel that they were experiencing anything out of the ordinary for all graduate students, male and female alike. They would not define themselves as feminists even in the face of blatant sexual discrimination such as professors showing slides of scantily clad women in class, sexist comments and jokes, and even sexual harassment. They did not internalize the events the way the feminists tended to do, and they often mentioned the fact that these "idiots," (the abusive male faculty and male graduate students), were just making the women stronger and better able to deal with the real world when they completed graduate school. The non-feminists tended to become empowered each time they were mistreated, whereas the feminists tended to feel more and more powerless at each act of mistreatment. These women felt that it was unnecessary for

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them to align themselves with a group of women in order to achieve their goals in life. They felt that the word "feminist" itself sounds unfavorable, and that as individualists they could believe in their own strengths as people (no sex specified.) These women commonly cited their ability to work hard to achieve their goals, including their common sense and natural talent. It was implicit in their discussions that since they could make it on their own, other women should naturally do so as well. The non-feminists felt that women should be fully responsible for their own success, or lack thereof. Many of these non-feminists acknowledged that the feminist movement did much for the advancement of women's rights to equality in the workplace. Yet, they didn't align with the movement because they want to be seen as individuals.

INDIVIDUALISM AS A PROTECTION AGAINST ALIENATION

The non-feminist respondents generally denied feeling powerlessness or meaninglessness while in graduate school. The general attitude among these women was that despite the sexism they experienced they believed that they were no more alienated than the average male graduate student, and that it was the graduate school experience itself that was bad. These women were likely to focus their frustration and anger at the faculty, staff, and financial aid office, rather than any generalized feelings of meaninglessness and powerlessness relating to their gender. Most stated that if anything, their experiences in graduate school, (while quite abusive generally), were actually making them stronger, and made them feel more powerful. They did share feelings of anger however. Those non-feminists who did discuss feelings of alienation, focused primarily on isolation. This is entirely in keeping with their individualist stance. They felt little or no connection to other students, and certainly no other women students, either in their programs or in graduate school. They noted that they would just have to work harder than other students because of their jobs or families. It was simply an observation, not particularly a complaint. The isolation they experienced sounded as if it were just something they would have to live with, and not something to sway them from their course.

While the non-feminists did recognize sexism in their departments, they still would not define themselves as feminists. They did not want to be seen as "women ________," and did not want to align themselves with a group. The non-feminists had a type of mental negotiation between their suffering and their strengthening while in graduate school. The feminists seemed to focus more on the suffering aspect of graduate school. These were clearly individualist sentiments.

FEMINISM DOES NOT PROTECT AGAINST ALIENATION

While most of the women interviewed in this study defined themselves as feminists, they were also much more likely than the non-feminists to describe feelings of powerlessness and meaninglessness while in graduate school. In terms of isolation, the feminists who mentioned feeling isolated always discussed this in relation to their interest in women's support groups, women's centers, or women role models. The feminists felt that their isolation would have decreased if only they had more women to talk to and depend upon during their graduate careers. Non-feminists were unwilling, or unable, to attribute their sense of isolation to their gender, whereas the feminists generally tended to attribute their isolation almost exclusively to the fact that they were women, a reflection of the importance of the connection between women in their daily lives. Many of the feminists were searching for connections to others, especially other women, and when their attempts were foiled, they tended to feel alienation. They felt a heightened sense of cooperation compared to the non-feminists, and found that cooperation was more productive, in terms of dealing with the stresses of graduate school, for them than competition. When they were unable to find other women in their programs with whom they could bond and interact, they felt a greater sense of isolation than did the non-feminists. The feminists genderized their experiences of isolation where the non-feminists generalized these experiences.

By far the most commonly reported type of powerlessness was the sense that men were almost always taken more seriously than the women were. Many women described professors who seemed to always be much more interested in what male graduate students had to say, male voices taking precedence over female voices. They insisted that males were more likely to be given teaching assistantships, research assistantships, computer assignments, lab time, and generally treated better than were the women. The disparities in handing out assistantships were never mentioned by these women for fear of reprisals, often in the form of never passing ones exams or orals. They also described their sense of powerlessness as resulting from the verbal mistreatment and lack of respect on the part of male faculty and male students with regard to women's attire or appearance. They felt that they were seen as nothing more than decorations for men's personal enjoyment, rather than legitimate academics worthy of respect as colleagues.

Individualism seems to be a much better tool to use as a protection against the stresses and strains of graduate school than is feminism. It appears that many of the non-feminist individualists have taken the best that feminism has to offer, such as self-determination and the belief in equality between men and women, whereas the feminists have taken perhaps the worst, the victimization facet. The irony in these findings is startling. The feminists seemed not to be empowered by their identification, indeed, felt more powerlessness than did the non-feminists, who reported feeling empowered by their graduate school experiences.

SOLUTIONS

Clearly, most of the women interviewed for this study experienced some type of sexual harassment, verbal abuse, or mistreatment at the hands of the faculty of this university. And while the non-feminists were not as likely as the feminists to internalize those experiences as powerlessness and meaninglessness, they nonetheless could have had a more pleasant graduate school experience. The feminists in this study felt that their lives would have been much better if there were more supportive women faculty in their programs, indeed, if there were simply more women in their departments to whom they could turn for advice and support. But the feminists often felt that there were few if any other women that they could depend upon for support. These feminists tended to search out connections to others, especially other women in their fields, and when they could not find women colleagues, role models or mentors, they ultimately felt a sense of powerlessness. Since the feminists in this study saw their experiences as shared by other women students, they also felt that through their work, perhaps women to follow would have an easier time of it in graduate school. Most of the feminists felt that, if given an equal opportunity, they could show themselves to be equal to men in their programs. But they were not given equal opportunities. If women are given the same opportunities for advancement as are men students, the women feel that there is no doubt that they would be considered to be equal to men.

Since the non-feminists tended overwhelmingly to be individualists (twenty-two out of twenty-six), it seems plausible that individualism immunizes women to feelings of alienation in the forms of powerlessness and meaningless. Perhaps the feminist women graduate students might learn something from the individualists, especially how to overcome the barrage of mistreatment in graduate school. The non-feminists tended in fact, to become more empowered at each act of sexism or mistreatment by a faculty member, while the feminists tended to feel powerlessness at these same acts. The individualist non-feminists wanted to blend in with the other graduate students in their departments, but the implication was that they wanted to be seen as "one of the guys." The non-feminists see the gender discrimination around them, but view it on a case by case basis, rather than as a form of social control. This is a successful strategy for avoiding feelings of alienation while in graduate school.

Since some of the women who defined themselves as feminists did so only after taking a women's studies course in graduate school, it can be postulated that some of the non-feminists might also self-define if they were simply more aware of the diversity of feminist thought. Clearly, the image of a bra-burning, man-hating, screaming bitch feminist is still largely seen as the prototypical feminist by many women. One of the functions of consciousness raising must be to dispel the myth of the only feminist being this type of woman.

Perhaps most importantly however, I think that feminism's constant hammering away at the victimization of women is not particularly helpful to women who are trying to empower themselves and other women. Rather than insisting that women are victims, as feminists often do, why not adhere to the empowering individualist sentiment, that as individuals we have the capacity to do whatever we desire. Since the non-feminists tended not only to not feel alienation, but also to clearly have a better time in graduate school than the feminists did, it seems obvious that individualism is a much more successful strategy in dealing with the stresses of graduate school. While the feminists may meet with one another in rooms to empower each another with ammunition for the argument that the world is unjust to women, the individualists are smoothly sailing on to their degree objectives.

I assure you, it is not at all easy to report findings such as these. I am particularly troubled that I may be seen as a traitor to feminism. I believe that I show my belief in and commitment to feminism by reporting the shocking findings of widespread sexual harassment at the University of Southern California. As a feminist, I believe that women should work together to better the lives of other women. Perhaps a women's group which consisted not only of graduate students but of faculty as well might solve the problem of women not feeling respected by faculty. But in what way would this compel the male faculty, or the male graduate students, to recognize these women as equals? Why do the individualists feel that they are already equal, and therefore do not need to identify with a women's group? I think that many of the individualists are seen as equals in their programs, whereas the feminists may be looking for gender discrimination where perhaps none exists. Or perhaps as feminists we might work within the existing system, as the individualists tend to do, and show that as women we are in every way as capable as men in our fields. Again, this is where the faculty in each of these departments needs to do some serious soul-searching to find if they are sexist, abusive, or otherwise unprofessional. Women on both sides of the feminism coin need to feel that they are safe from abuse and harassment while in graduate school, and safe from reprisals.

Ultimately the changes needed in graduate education regarding its treatment of women scholars will need to come from the more established members of the academic community. Graduate students are not in a position where action can easily be taken, because their presence at the university is temporary, and time spent on activism inevitably detracts from time spent in studies, as well as placing the individual at risk for retaliation. In addition, the ethos of the American university emphasizes individualism and competition, not cooperation, thus atomizing potentially cohesive groups. Thus, it is incumbent on the academic system itself to mend its ways, at the risk of losing an enormous pool of talent necessary for its own self-preservation, as well as the economic and intellectual health of the society at large.

Sustaining Voice through Electronic Intergenerational Connections

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In a study of girls' development, Brown and Gilligan (1992) conclude that adolescence for many girls is marked by a "series of disconnections or dissociations" leaving girls at risk and in a "relational struggle" (p. 6). In an attempt to be "perfect," adolescent girls often become separate from their sense of self, a separation that can lead to the loss of voice for adolescents and to other complex problems as girls become women. Belenky, Clinchy, Goldberger, and Tarule also report that women's voices are frequently muffled, particularly in the classroom that does not encourage the building of relationships (p. 229). The classroom research in this paper describes an investigation of a unique intergenerational project that had as one goal the increase in self esteem that is so much a part of being able to claim a voice of one's own. Through electronic mail (e-mail), eighth grade English students connected to senior citizens and formed relationships that benefited both parties. Senior citizens were able to reach out to a new generation of young women, and adolescent girls made friends with caring, concerned adults with whom they could share daily experience.

Theoretical Grounding for the Project

Voice, an elusive concept not so much proven as realized, emerges in the literature of rhetoric and psychology. The problem for writers, according to Elbow (1981), is that they either write with "no voice" or they write with a voice that lacks the energy of "real voice" that originates from the "writer's center" (pp. 287, 298). When real voice emerges in writing, the writing "has the power to make you pay attention and understand--the words go deep" (p.299). Such writing often results from "growth and development rather than mere learning" (p. 302). In exploring the development of women, Psychologist Gilligan (1982) purports that women speak in a different voice from men--a voice that attends to human relationships in the context of care and connection more than to justice and fairness attributed to male moral reasoning, a voice that begins its shaping in the child's early years. According to Gilligan, women's different voice at times causes trouble for women, leading to a silencing in relationships that accounts for "the elusive mystery of women's development" (p. 23).

To investigate this enigma in women's development, Brown and Gilligan (1992) turned to adolescent experience. Their research reports that girls struggle "to stay in connection with themselves and with others, to voice their feelings and thoughts and experiences in relationship" (p.4). These researchers raise the question: " Are these losses of voice and relationship necessary, and, if not, how can they be prevented?" The intergenerational e-mail project described here was undertaken, in part, to extend to young women a safe space for exercising voice during the turbulent period of adolescent development.

As computers have become more prevalent in the schools, educators have begun to explore their use for social interaction (Myers, 1993; Turnow, 1993). Selfe (1990) notes the benefits of this use of computers for shier, less confident students, particularly female students. Likewise, in a study of writing courses taught entirely through computer networking, Fey (1994) reported that the freedom of asynchronous computer communication, combined with a liberatory curriculum, contributed to the development of voice among adult female students. Voice in Fey's study emerged as a changing construct, emanating not from a sovereign self but rather forming, as Bakhtin (1981) suggests, outside the self in relationship to other voices. Wayne Booth summarizes Bakhtin's sense of the development of voice:

> From the beginning, we are "polyglot," already mastering. . . social dialects derived from parents, clan, class, religion, country. We grow in consciousness by taking in more voices as "authoritatively persuasive" and then by learning which to accept as "internally persuasive." Finally we achieve, if we are lucky, a kind of individuality, but it is never a private or autonomous individuality....[W]e always speak a chorus languages. (p. 294)

Thus, according to Bakhtin, the reality of meeting through relationship, as happened in the intergenerational connections in the present study, is instrumental both in shaping voice and in freeing voice from within.

The Context and Methodology for the Study

The intergenerational connections were made possible by Project SUCCESS (Seniors Using Computers to Communicate and Educate Special Students). In this study, the majority of the seniors resided in a church home. Project SUCCESS began as a pilot program through the support of the Retired and Senior Volunteer Program of Rochester, New York, Rochester Telephone Corporation, and Prodigy Services, Inc. The program aimed to demonstrate the social and educational benefits of computer networking technology with a primary objective of improving students' self-esteem. The current research study focussed on students from classes of one teacher during 1994-1995. The school is located in one of the largest rural school districts in the state. With only a limited number of grandfriends, students were selected to participate by their applications and/or recommendation by the school counselor. Students wrote to their "grandfriends" on the one available computer and modem in their English classroom, entering messages usually twice weekly.

Data included selected messages of participating students and senior citizens, open-ended interviews with selected students and their pen-pal senior partners, and videotapes of an end-of-the year, face-to-face meeting of grandfriends and students. Analysis followed ethnographic methodology.

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Sustaining Voice through Computer Communication

Of the nine students interviewed, all were enthusiastic about the project. Relationships developed that in some cases extended beyond the school year, with contacts maintained by mail, telephone, and/or occasional visits to the seniors. With no restrictions on the content of communications, students' messages covered a range of topics including personal information, school activities, special events, hobbies, and personal feelings. Students also asked for advice, voiced opinions, and shared secrets. The following vignettes and reflections on the project suggest typical patterns of response and reflect how these special relationships opened communication between young girls and senior citizens and offered a site for developing and sustaining voice.

Angel, for example, turned to her grandfriend for solace after being "grounded" by her mother. Their relationship reached an intimacy that led Angel to comment that not even her own grandmother would share so much with her. Nicky also spoke about personal issues with her grandfriend: "My mom and dad are divorced. I live with my mom and her boyfriend in our new house." She ended one note, "Thank you again. I just wanted to let you know that your letter made me feel much better."

Chrystal, currently interested in roller blading, swimming, and soccer, received a new view of the elderly through the project. She was surprised to learn old people just don't "plop down" but are often active. She also appreciated her grandfriend being open minded about her parents' being divorced and that she lived with her dad and his girl friend. Indeed, her grandfriend Gladys had much to say to Chrystal on this matter since she herself had had a stepmother. When Chrystal shared New Year's resolutions, Gladys responded, "You made a good resolution by saying you will try to be nice to your family. I know sometimes it is hard especially if brothers or sisters pick on you. Hopefully they will grow out of that habit and later in life will become your best friends." Chrystal reflected that she had more in common with her grandfriend than her own grandmother. She also noted the freedom of computer communication, reporting that this medium was good for shy students like herself. After this experience, Chrystal is more open to different people and feels more comfortable talking to them.

Though afraid of the computer, Sarah, age 14, found a friend in Betty through the e-mail correspondence. Living with her dad and sister, Sarah appreciated the companionship of Betty, age 85. Sarah wrote approximately 100 messages--more than any other student--and Betty responded to most of them. The computer exchange added excitement at the beginning of Sarah's day, when each day Sarah hurried directly from the bus to her English class to check the screen for mail. At times Sarah became frustrated with the computer and was disappointed when Betty's messages occasionally failed to get through. In Sarah's case, extending the boundaries of the classroom introduced this young girl to an authentic literacy experience that made English class "fun."

Sustaining voice was tenuous for fourteen-year-old female student Jamie whose messages to her pen pal Helen, age 96, reflected volatile emotions. Jamie wrote:

> Dear Helen,
>
> . . . So, how are things with you? Today is just one of those days, the days you don't feel like being alive. Oh, well, I'll get over it. What kinds of things do you do to keep yourself busy? I'd like to know more about what it's like to be. . .Well, basically...YOU!!!! I already know what it's like to be, Boring Old Me. . . .I just want to know more about you!!. . .
>
> Yours truly,
> Jamie

Jamie rebounded and in her next message wrote:

> Dear Helen,
>
> Hey! How's it going? Not too bad here. Well, Valentines Day is fast approaching. I spent around $10.00 on my boyfriend. His name is Mike. We've been going together for 3 months and 4 days. He is very special to me. I know many adults may say, that us kids DON'T know what love is, but I feel this is different. Do you get where I'm coming from?. . .
>
> I can't wait till Valentines Day. I hope yours is splendid.
> HAPPY VALENTINES DAY !!!!!!!!!!!!!!!!!!!!!!!!!!!!
>
> Your pen pal,
> Jamie

Two weeks later Jamie's mood catapulted as she shared an emotional upheaval so typical of an eighth-grade girl:

> Dear Helen,
>
> . . .I've been rather depressed, lately. Last Thursday, my boyfriend broke up with me. He said it was because he couldn't trust me. Then the next day, in first period math, (this was the day after we broke up), I turned around to talk to him, (he thought I was mad at him), he looked at me strange. I guess he didn't expect me to talk to him. I wasn't mad, just sad. He "dumped" me at 3 months and 3 weeks.
>
> Yesterday Mike got a new girlfriend. I guess I don't mind, too much. I've heard that a few people like me, so I should be alright, I hope.
>
> So, how are things with you? Other than what I've told you, I guess I'm O,K. Hope to here from you soon! ! !
>
> Yours truly,
> Jamie

A subsequent message revealed Jamie as a spirited teen struggling to stay in relationship with squabbling friends:

> Dear Helen,
>
> Bonjour!!! How are you? I'm fine, I guess. Last night was my chorus concert. I think I did rather well, I was surprised my voice

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> didn't crack. My mom was there, and a couple of friends too. I was very nervous. I had a speaking part too. Mind you, I did quite well.
>
> Who are your good friends? I have a lot of friends, most are pretty faithful too. The only problem with some of them is (not that I don't like them, I do) they are always starting all these petty fights. Most of the time, I just let everything go. I try not to let things get to me, but it doesn't always work. The bad thing about me is I have a VERY BAD temper. At times, I try to control it, but the anger gets the best of me. But most of the time, I am a pretty controlled person.
>
> So, what's been going on with you?. . . May 31st, I get to meet you! June 1st, I have a French speaking final. . . .
>
> Well, I'd better get going. Can't wait to meet you!
>
> Love always.
> Jamie

The same day Helen responded:

> Dear Jamie,
>
> I am anxious to meet you also. Won't that be something? I never thought that would happen. . . .
>
> Your friend,
> Helen

A spirited adolescent, Jamie volunteered for the project because she liked people and enjoyed "putting up a good argument." Even so, she struggled in relationships, similar to the girls in Brown and Gilligan's (1992) study, and the connections with Helen allowed her to voice these feelings. Helen herself was a strong person; Jamie found her "down to earth," certainly not "a-lady-in-a-white-dress-porch-woman," as she envisioned most women of Helen's era. She learned that as a young girl Helen had worked hard on a farm, caring for her father when her sickly mother was unable to. Jamie particularly admired Helen's courage when, at age twelve, she rescued her father from a tractor accident. Grandfriends like Helen added a new dimension to the lives of Jamie and her classmates.

Conclusion

The e-mail interactions reflect the haven that adolescent girls found in their grandfriend relationships. The project not only provided these girls with access to the computer--something to be encouraged if women are to achieve equity in schools and society (Spender, 1994)--but also offered a safe space to voice girls' concerns. Though occasional computer problems limited the development of some relationships, e-mail connections offered most students a site to work out beliefs and acknowledge feelings in relationship with trusting adults. Such interactions appeared to aid female students in sustaining voice during an unsettling period of their lives, perhaps, to a degree, warding off the loss of voice that, according to Brown and Gilligan (1992), can occur during these transitional years. The young women's appreciation for their intergenerational e-mail relationships is epitomized in Stacy's tribute to her grandfriend:

> I used to think old people were crippled, deaf, blind, and dumb. But my grandfriend Mary knew exactly how I was feeling and why I was feeling the way I did. She taught me that aged people are wise. "Young at heart" is a great description of Mary. If I hadn't known her age, I'd guess she was thirteen just like me. I wrote to her when I was angry, upset, and happy, when everything was going wrong and when my friends got me mad. I talked to her about the past, present, and sometimes the future. Mary is a great "grand" friend.

Such humanistic uses of computer communication in the classroom can play a role in girls' development by enabling girls to sustain voice and thus more easily stay in relationship with themselves and others.

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MATERNITY LEAVE POLICIES IN RESEARCH UNIVERSITIES

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Over the last twenty-five years, the increases of faculty women in academia has been primarily in the junior ranks; women have not made equivalent gains into the senior faculty ranks. This inequity is most striking at doctoral-level universities, where women make up only 10% of the full professors (Academe, 1992). While the explanation for this inequity has focused on sexism and entrenched hierarchical systems, the possibility that this inequity might be linked, at least in part, to faculty women's pregnancy and child care needs has been slighted.

There is a long and somewhat controversial history concerning working women and the development of special policies or rules to protect them (Vogel, 1993). Some have argued that the most effective way for women to gain equality is to acknowledge no differences between men and women (Reskind and Roos, 1987; Hare-Mustin and Marecek, 1990). Reskind and Roos (1987) conceptualized that subtle barriers exist for women in a number of fields and assert that "deep-seated beliefs in innate sex differences" account for continuing status hierarchy. This theory disregards the fact that very real and important gender differences do exist between men and women: most notably, women bear and nurse their young. While historically, some protections for women have at times led to inequities in work and in society (Baer, 1978), the approach of denying the fact of gender differences has not led, in academia, to the hoped for equality between men and women. It may be that only when such differences are fully acknowledged and accepted, and policies which recognize the different needs of women, such as maternity leave policies, child care leaves, and tenure extensions, are fully implemented, will women gain an equal stance with men.

Most analyses of the causes of inequity in universities have focused on sexism, cold or hostile environments, and an "old boys network" (Sandler and Hall, 1986; Solomon, 1985). To fit into the male world of the academy, the earliest faculty women remained unmarried and had no children. These unwritten rules were gradually relaxed. With the influx of women into the academy since the 1970's, the number of married faculty women and married women with children have swelled. The resulting work/family conflict for faculty women with children was acknowledged by the AAUP; in 1977 Committee W on the Status of Women in the Academic Profession made a statement amplifying the AAUP Statement of Principles on Leaves of Absence, recommending that leaves of absence be granted for "...illness, recovery of health, and maternity" and that "colleges and universities provide leaves of absence to faculty members for child-bearing, child-rearing, and family emergencies" (AAUP, 1977, 93). However, while this document asserted that universities should adopt these policies, it was only a suggestion, and inconsistent with the AAUP's rigid seven year mandatory tenure review policies; taking a leave may mean less time to meet the requirements for achieving tenure. In 1978 the Federal Pregnancy Discrimination Act was passed requiring employers to treat pregnancy like any other temporary disabilities. This was an amendment to Title VII of the Civil Rights Act of 1964, which had barred gender bias in employment. The Pregnancy Discrimination Act (42 U.S.C. S2000e (k)), precludes discrimination on the basis of "pregnancy, childbirth, or related medical conditions" as a form of sex discrimination. Employers covered by Title VII are obligated to ensure that women "affected" by pregnancy are "treated the same for all employment related purposes, including receipt of benefits under fringe benefit programs, as other persons not so affected but similar in their ability or inability to work." Sick leave policies, with and without pay, may not be less for women faculty as a result of pregnancy and childbirth than they are for any faculty member suffering from another illness or disability.

The expectations on all new faculty regardless of gender during the probationary years at an institution are to "hit the ground running" (Whitt, 1991). Goals are high for publishing one's research, serving the university, and teaching (Tilghman, 1992). For those women faculty who decide to become mothers during this period, this choice creates an additional responsibility which may interfere with their ability to achieve tenure within the prescribed time limit and may place them off the "tenure-track" permanently. With the increasing number of female junior faculty (Ottinger and Sikula, 1993), the need for adequate maternity leave policies has become more urgent. Mandatory tenure review specific to universities places increased demands on some women faculty. Women of today, writes Hensel, "must make a choice between high achievement and having a family; a choice that most men do not have to make" (Hensel, 1991). Rothblum found that many women leave academia before the tenure decision is made (1988).

This study investigates how universities are confronting the special needs of women faculty who choose to have children: specifically it assesses policies relating to childbirth and infant care and examines the implications of these policies on tenure processes.

METHODOLOGY

The population for this research study was the 60 institutions that are members of the American Association of Universities. Provosts were asked to provide information about their institution's policies on childbirth and infant care leaves and related tenure probationary period structures. Some administrators sent copies of their university's leave policies, several sent entire faculty policy booklets, and still others, in process of making sweeping changes in these areas, sent additional literature which was relevant to these questions, including institutional reports, findings of committees, and general statements. The response rate was 80%.

RESULTS

Only twenty percent of the responding institutions' policies include no specific mention of maternity or infant care issues, although the sick leave or disability policies should apply in case of childbirth and recovery. Of the eighty-percent which specifically mentioned pregnancy or childbirth in their policies, sixty-two percent addressed pregnancy or childbirth leaves through their sick leave policy: whatever benefits are allowed through sick leave are also allowed for childbirth and recovery. A six-week paid leave was the most common amount of time allowed for this purpose. Twenty-six percent of the respondent universities have leaves specifically for maternity purposes (differentiated from sick or disability leave). These ranged from two weeks paid leave to twenty weeks paid leave. Some of the paid maternity leaves begin during the last month of pregnancy, others begin at the birth of the child. Each of the schools with specific maternity leave policies followed that allowance with additional leaves: either traditional sick leave, unpaid leave for periods of time, or partial leave tied to other flexible work arrangements.

--Seventy-four percent of the responding universities allowed women faculty to follow the exhaustion of paid maternity or sick leave benefits with an unpaid leave. These leaves ranged from eight weeks every two years to one year for each child born. In some cases, such leaves are granted automatically upon request. In other institutions, any leave is granted only with review and approval of the department chair or dean.

--Leaves for fathers were specified in thirty percent of the policies. These leaves ranged from two weeks of paid leave to up to an academic quarter of unpaid leave. In one institution, new fathers who were the primary caretakers of their children could receive modified duties with pay.

--Adoption was specifically mentioned as a valid reason for leave in thirty-two percent of the policies. In addition, leaves for adoption were implied in the policies of twenty-six percent of the other schools ("family leaves" or "new parent leaves"), and combining these, fifty-eight percent of the institutions have some allowance for leaves for adoption. Most of these leaves were unpaid, although one school specified two weeks paid and four weeks unpaid for an adoptive parent, and another allowed the use of sick leave for an adoption.

--Twenty percent of the universities specifically addressed a part-time work option for a period of time for parents after the birth of a child, such as through reducing the research requirements or other university responsibilities. Twenty-six percent allow a reduced teaching load after the birth of a child. One granted up to six years on an agreed upon percentage (10%-50%) work-time with pro-rated pay.

There may be an impact of childbirth and infant care leaves on tenure decisions. Time spent away from work during the probationary period, without some extension of the tenure decision, may mean that in order to achieve tenure, the faculty member will have to accomplish the same amount of work in less time. Ignoring the effects of time away from research and teaching can only contribute to the gender inequity in universities. Women will not be treated equally by a policy which does not take into account the fact that an infant will take time away from university responsibilities. Maternity or infant care leaves become more relevant and useful when there is some corresponding increase in the length of the probationary time before the tenure decision. This study found:

--Extension of the tenure clock was specifically mentioned in eighty-eight percent of the policies, permitting individuals to delay the tenure decision for some period of time. Universities usually addressed the tenure extensions in one of two ways. Almost half of the universities granted one-year tenure extensions when an individual had taken a substantial leave (four or six months). The other norm for the universities which had tenure extension policies was to credit the tenure clock for only the time spent away from the university on leave.

--In some institutions such tenure extensions are granted automatically upon request, in other institutions, they are decided on a case-by-case basis. Two schools specified a maximum of ten and eleven years respectively, by which a tenure decision had to be made regardless of extensions; another school indicated that a maximum of two one-year extensions would be allowed, regardless of the numbers of children born.

DISCUSSION

The social sanctions which prevented women with children from working in academe are gone, but women are still confronting the conflicts between their careers and their families. In order to succeed in gaining tenure, women must demonstrate to their colleagues that their work is of primary importance: a quick return after childbirth for some may be a necessity. The inclusion of maternity into the sick leave policy at many universities theoretically allows women the opportunity to take time away from work without retribution. University policies that allow time for women to bear and care for children within the context of the tenure probationary period may effectively contribute to eliminating status hierarchy based on gender.

These policies are demeaning, however, when the leave policy requires that a woman must get permission from her department chair or dean to take a maternity or infant care leave. In such cases, she continues to be dependent on the largess of her colleagues to receive such a leave. A woman faculty member may feel that she is under pressure not to take such a leave.

Generous maternity leaves alone may not be enough to ameliorate the situation for women. A recent study (Finkel, Olswang, and She, 1994) found that only 30% of women eligible to take a paid three month leave took the entire time off. Forty percent took no official leave at all. These faculty women reported that they are concerned that taking time away from their work will give the appearance to their colleagues and chairs that they are not serious about their careers. Faculty members of all ranks reported that their careers might be hurt if they took time off for a leave, even though such leaves were permitted by written policy and overwhelmingly supported by their faculty colleagues. However, in the same study, a large majority of both men and women indicated that they would take a three month leave after becoming a parent if their same sex colleagues would do the same.

The responses to the current survey reveal that a substantial number of AAU institutions are now concerned with and are more openly supportive of maternity and infant care leaves and tenure extensions. Many of the policies that were examined had been recently updated, and there were some reviews being developed. Some of these university policies include statements acknowledging that women who give birth during their probationary employment period at a university have been at a major disadvantage in their quests to achieve tenure. Several universities are charged with the task of developing and implementing child care services for faculty and staff. One written policy begins,

> In recognition of the effects that pregnancy, childbirth and related medical conditions can have upon the time and energy a woman has to devote to her professional responsibilities, and thus, her ability to work at the pace or level expected to achieve tenure...

Another policy acknowledges, "Pregnancy or childbearing may lessen faculty member's scholarship for a period of time..." Yet another university includes in its policy the following statement:

> Another set of issues that the university should address as it prepares for the next century concerns the distinctive needs of faculty members who have the responsibility for the care of young children...the university's response to these issues will, therefore, have a direct bearing on its ability to attract and retain talented women on its faculty.

RECOMMENDATIONS

From the policies examined in this study, several consistent themes or practices were identified: pregnancy complications and childbirth as paid sick leave; partial or full unpaid leave for care of an infant; equivalent leaves for fathers; leaves for adoption; and tenure clock extensions. Some of the more creative approaches provide good models for policy development.

PREGNANCY AND CHILDBIRTH LEAVES: Women who suffer medical complications due to pregnancy or who give birth, requiring a normal recovery period, must receive a paid sick leave of equivalent duration given to any faculty member who becomes otherwise ill or disabled. The mean average time of the paid leave, in AAU institutions is 7.6 weeks. Doctors documentation should be required for all sick leaves, regardless of their causation.

INFANT CARE LEAVE: Faculty members should be allowed to take unpaid leave for infant care following a paid childbirth leave, with the guarantee of the right to return to the position. The Family and Medical Leave Act requires that a parent receive no less than twelve (12) weeks leave with continuation of paid medical benefits after the birth of an infant with a guarantee of the right to return. Such leaves could be either full or partial. Some maximum limitation on the length of full time unpaid leave should be adopted, with one to two years being consistently used in the AAU schools. If a faculty member chooses to work part-time for an extended period of time, a plan for resumption of full-time work should be determined in consultation with the administration.

LEAVE FOR ADOPTION: A faculty member who adopts an infant should be able to take a leave for a minimum of 12 weeks. The leave, either full or partial, should be allowed for infant care for adoption purposes just as it is available to natural mothers and fathers who choose to care for an infant.

THE TENURE CLOCK: In recognition of the added obligations which caring for an infant puts on a faculty member, the tenure clock should be extended. The growing trend in AAU institutions is to extend the tenure clock for one year for any faculty member who has or adopts a child, whether or not that person takes a leave and regardless of the length of leave taken. For faculty taking a partial or full leave for a second year, that year also should not count on the tenure clock.

To eliminate the fear of retribution, leaves and tenure extensions should not be discretionary; they need to become a vested faculty benefit. Information concerning policies for maternity leaves, child care leaves, and tenure extensions should be widely disseminated among all faculty and administrators. These actions will increase the likelihood that, for faculty members who take leaves or tenure clock extensions, tenure decisions will not be adversely affected. All such policies must be administered neutrally.

The extension of these policies will move the academy further along towards increasing the number of senior women in the faculty ranks.

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GIFTED GIRLS: PROMISE OF THE FUTURE

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In a recent newspaper column, Lucia Herndon writes about Hillary Clinton: "I was disheartened to read accounts of Hillary Rodham Clinton's recent luncheon with a group of journalists. She told these reporters that she was concerned about her image. She feared that she came across as harsh and unlovable. She wondered how that happened and what she could do to change it." If a highly gifted and successful attorney, wife, mother and first lady feels so insecure and needy, how must gifted girls who find themselves dealing with the same issues feel? The following paper is an attempt to examine the socialization of girls in American society, and to explore how these experiences shape the lives of gifted girls. Until their potential is truly tapped both intellectually and emotionally, the real potential of these girls will never be realized.

In the last few years, much of the literature in gifted education has focused on "at risk" categories of students, with gifted girls frequently included. Although some gender differences seem innate (e.g. brain differences in processing verbal information, *New York Times* Feb. 16, 1995, p. 1A), there is much overlap in ability and academic strength. Yet gifted girls are vulnerable to underachievement regardless of their talents in specific subjects, social class, or parent education, and thus represent a potential loss to society and to themselves when they become adults. Therefore, they are of particular concern who those who work with gifted populations.

Gender socialization and preference begin before birth. Throughout the world, studies have shown that the desire is greater for a boy, especially if one is having a first/only child. Once a baby is born, caretakers and parents perceive children differently in the nursery. In one study, adjectives used to describe girls included pretty, petite, and sweet while boys were seen as strong, attentive, and well-coordinated. Girls are commonly seen as more vulnerable, although more males die in their first year than do females. By nine months, Eleanor Maccoby found, there was more rough and tumble play with boys, especially boys and their fathers.

Toddlers and young children also are treated differently based on sex, and therefore they react differently. Children pick up gender clues when learning to talk. When reading to toddlers, parents used more inner state words, words about feelings and emotions, to girls than they did with boys ("The Pinks and the Blues"). Enter any classroom of three year olds, and one is struck by the stereotypical ways in which children of different sexes are playing. Boys are using blocks, Legos, and trucks. Girls tend to congregate in the "doll corner", playing house and dressing up. As Linda Silverman points out, "Gifted girls are chameleons. From the time they enter preschool, they learn how to ***blend in*** with their peer group so that they are 'just like' all the other girls. If a girl's social group is developmentally much younger than she is, she will frequently don the mental attire of her friends, and will soon be imperceptible from them in thought, manner, and achievement" (p. 300). By the age of five, boys are more likely to interrupt one another, to use commands and boasts of authority, to refuse to comply with another child's demands, to tell jokes or suspenseful stories, and to call another child names. Girls, on the other hand, will pause to give another girl a chance to speak, will acknowledge what another girl as to say, and will listen and try to be accepting. Brown and Gilligan found that first and second grade girls are able to define how to be "nice": wait your turn, be polite, listen to others; all these things will help them to have more friends, and being happy is defined as having friends. Hence, girls see language as a socially binding process rather than as an ego function, a way to accomplish their goal of getting and keeping friends.

Parents also help to reinforce stereotypes. They cherish different dreams for their daughters and sons, and also react differently to them. Both parents expect boys to be more independent, to be better able to control their feelings, and to assume more responsibility. Both parents are stricter with boys than with girls, and also expect boys to be more strong-willed. Boys find there is much emphasis on the importance of achievement and the value of competition (e.g. competitive sports at an early age). They are expected to be self-reliant as well. Girls' relationships with their parents are closer, warmer and more intimate. Parents pressure their daughters to be obedient, kind and unselfish, and well-mannered, and supervise their activities more closely. As Lindley and Keithley (p. 214) point out, "The concept of learned helplessness is developed at home and in school by adults who encourage dependency by females and who assume incapabilities where capabilities exist."

The mass media also pay a disproportionate amount of attention to boys and their needs. If only girls watch a show, it is likely to be cancelled; two examples which come to mind are "Kids on the Block" and "My So-called Life". Almost all cartoon characters, spokespersons and actors one sees in television commercials are male. Most Saturday morning commercials are targeted at boys, especially toy commercials. In a recent study from Annenberg School (University of Pennsylvania) called "Women and Minorities on Television: Casting and Fate", women were found to be represented on one of three prime time shows, one of four children's programs, and one of five news programs. They age more quickly than men, and are more likely to be portrayed as evil or unsuccessful. Hollywood too aims movies at men rather than women; men's movies are big budget films, and women's low ("The Great Divide: The Sexes At The Box Office". *New York Times*: July ll, 1993). Many box office hits emphasize the importance of sex and beauty, or are blatantly anti-feminist. Popular magazines for teens, such as *Seventeen* and *Teen*, again reinforce stereotypical images; emphasis is on how to dress, how to use makeup, and how to get and keep a boyfriend.

Toys too are clearly stereotypically gender based. Any toy store has clearly marked "girl" aisles (with Barbie dolls, toy kitchen equipment, and makeup) and "boy" aisles (with trucks, blocks, Legos, and models). In schools, basal readers and novels both have a disproportionate number of male heros who do exciting things; females are limited both in number and in the kinds of activities they are permitted to participate in. Even the biographies available to young girls are disproportionately about males. Cartoons illustrate the stereotypes as well: Who cannot laugh at the antics of Calvin, as he plots misdeeds aimed at Margaret and Mrs. Wormwood, his teacher!

In short, boys and girls think differently about themselves from a very early age. Therefore, they develop distinctly different ways of approaching and dealing with the world. Girls' lives are more structured, more supervised, more circumscribed and more protected from experience. Girls are kept closer to home, and have fewer opportunities for discovering, for inventing, and for *actively* understanding the world in which they live. Boys get the message that they can create effects on the world; they have a sense of mastery that they can effect change. Hence, their self-esteem is higher, even in elementary school.

The role of the school is especially important to gifted girls. If we are to believe Raphaela Best, girls come to school prepared for conformity, perfectionism and teacher pleasing. At the same time, their earliest teachers tend to be women, who have been socialized in the same ways as the parents of the girls. Even Best, a sociologist who observed children in school over three years, unconsciously focused on the boys in the class because they were "more interesting." Only after she realized this was she able to give the interaction of girls equal consideration. Best strongly emphasizes the socialization aspects of school. She writes extensively of the "Second Curriculum", the one which teaches boys how to be boys and girls how to be girls. Because girls come to school already primed for archetypal feminine roles, they wish to be helpers, and attempt to control other children by worrying about the interests of the other child. They take up less space on the playground, and become dependent upon teacher praise for security. These needs become more ritualized as students move up the grades. Barrie Thorne, writing in 1991, found that the price of moving away from one's gender role, even for small children, is ostracism. The Sadkers' well-known studies of teachers and their interactions with students further reinforce the role of girl as

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passive and quiet. When teachers call on boys, their questions are more probing and "high level" ; their interactions with girls are usually praise for conformity and passivity. Girls are expected to perform well on verbal skills; they write more neatly, read better at an earlier age, and want to be helpful. All of these characteristics are neither bad nor good in themselves, but for gifted girls they become a kind of "cop-out" if they choose to conform to expected norms.

When one thinks of the characteristics of giftedness, those most commonly expressed describe gifted boys more than they do gifted girls. Gifted children are seen as highly verbal, curious, eager for new learning, and anxious to explore their interest in great depth. Yet many gifted girls are "secretly smart", reading extensively on their own, exploring their interests privately, and not acknowledging what they know to others in the class (including the teacher). Such students should not be made to languish in regular classrooms without modification, merely because they have learned too well how to be "good girls."

Lee Anne Bell says that gifted girls are confronted with a number of dilemmas that set them up for academic failure. First, girls feel torn between their desire to be smart and their need for social acceptance. Their goal is to be part of the "in" group, even at an early age; this need becomes even greater as they enter the middle school years, and often does not disappear. In terms of asking probing questions, pursuing knowledge in depth, and exploring areas of interest (especially ones not considered "feminine", like math, science or computers), many girls are afraid to risk the derision of their peers. Second, Bell points out the conflict between silence and bragging. Boys tend to "pat themselves on the back" for academic accomplishments; girls, on the other hand, are quiet about their successes, worried that if they talk about their discoveries or knowledge, they will be seen as boastful.

A third dilemma for girls is the fear of failure and the desire to be "perfect". Girls internalize failure, especially in math and science, and therefore, in order to get good grades, avoid what they perceive to be "difficult" subjects. Since teachers tend to grade not on what students know but how much they conform, especially in the early grades, the desire for external reward (e.g. good grades) overshadows the ability to take risks in an unknown area. A fourth issue for is the need for physical conformity; they do not want to be seen as "nerdy" or marginal. Over the years, several of the girls I taught have been hospitalized for anorexia and/or depression; others have been treated extensively with therapy and medication. Much of their distress, I believe, comes from their need to be accepted and from their need to conform to some teenage feminine stereotype.

A fifth issue for gifted girls is the need to be passive versus the real need to be aggressive or assertive when pursuing knowledge or asking questions. Again, the "feminine" thing is to be quiet in class, not answering much and not asking questions when one does not understand. Even the words "aggressive" or "assertive" does not mean the same when used to describe a male and a female; in many cases, an "aggressive" male is the norm, and an "assertive" man is what businesses search for. For women, the connotation of these words is much more negative. A last issue, according to Bell, is the desire for conformity versus the fear of being punished. Punishment can take many forms: lower grades, peer rejection, isolation. All of these are contrary to most gifted girls' image of self.

Given the above information, is easy to understand why fewer girls take advanced math and science courses, and fewer are found in computer courses as well. According to studies conducted by Meredith Kimball and reported in the *Newsletter of American Women in Mathematics* (1992), boys, who take more math, have a learning style that is autonomous; they strive to understand, while girls rely more on rote memorization. Girls also express a helpless orientation as opposed to mastery orientation; boys believe they *can* understand difficult concepts, while girls, even if they do understand these concepts, feel that it is because of luck rather than true knowledge. Learning style also affects girls' performance in math; they are better at cooperative learning, and prefer to solve problems in groups. Males, on the other hand, prefer to "go it alone." If teachers fail to recognize and attend to these differences, girls drop quickly from the fast-paced math track. Educators are now beginning to experiment with single sex math classes ("All-Girl Classes to Help Girls Keep Up With Boys", *New York Times* , Nov. 24, 1993). As the author, Jane Gross, points out, "Laura, Amber and Cara don't feel embarrassed, intimidated, distracted or ignored anymore because now they are learning math and science in all-girl classrooms in three California schools. The schools have adopted segregation as a way of solving the widely acknowledged problem of girls lagging behind boys in math and science from middle school onward" (p. 1). *Newsweek* (May 16, 1994) had a long article entitled, "Men, Women and Computers", pointing out that "cyberspace . . . is marred by just as many sexist ruts and gender conflicts as the Real World" (p. 46). Even the *New York Times* felt it necessary to profile women who work with computers as "Woman, Computer Nerd --- and Proud" (August 29, 1993, Section 3, p. 1). One can see that much work needs to be done to give girls the confidence they need to succeed in these areas today.

Although the dangers for gifted girls begin early, the biggest crisis occurs at adolescence. The key, as Peggy Orenstein points out, is a failure of self-esteem. By that time, according to an AAUW study, 47% of boys like themselves, while only 29% of girls do. Gifted girls at adolescence are more timid and anxious, feel powerless to control events, and have become even more passive than they were at earlier ages; Linda Silverman describes them as "disappearing." Gifted girls really identify with the protagonist in *Cat's Eye* by Margaret Atwood who, despite her obvious brightness, worries most about the acceptance of her friends; my eighth grade students echo these concerns as well. Studies support the loss of self-esteem for gifted girls (and all girls) at adolescence. Carol Gilligan's work highlights the conflicts adolescent females feel, describing with compassion their need for acceptance by others and their loss of "voice". Kline and Short summarize the problem well: "Self-perceived abilities and confidence for girls clearly declined progressively from elementary and primary grades through junior high school, and further declined through senior high school. By high school, the females feel significantly less willing to reveal themselves to those around them, hiding their intelligence, sensitivity and feelings, and trying to act tougher than they are" (p. 120). Terman and Oden, in a classic longitudinal study of gifted people, found that there was an average nine point decrease in IQ over time, but it was five times larger for girls than for boys. Girls scored an average of 13 points lower, boys an average of three (cited in Kerr, p. 98). Felice Kaufmann, who studies Presidential Scholars, found that the highly gifted girls she interviewed were loners and non-joiners, who expressed little need for social acceptance and recognition (presentation at PAGE conference, Philadelphia, PA 1985). Their goals for themselves were for self-actualization, yet many entered traditionally female professions in the humanities and secondary school teaching. A 1986 study at Pennsylvania State University pointed out that when boys drop out of the high achievement group, their self-image drops. For girls, there was a tendency for self-image to improve as achievement declined. Kathleen Callahan, well known for her work in the area of gifted, found that gifted boys and men appear to differ from normal males in many more traits than gifted girls and women differ from normal females. This phenomenon is supported by my classroom experiences; many girls are "secretly gifted", refusing to let others know how able they are academically. An outstanding example of this is Jen, a girl I taught some years ago. Although she loved math and physics, her persona was that of a "dumb blonde" who got good grades purely by accident and luck. Fortunately, there were people in the school who refused to let her fall into stereotypical patterns; she subsequently attended the University of Pennsylvania and graduated with a degree in architecture. How many girls, lacking this kind of support, "settle"? Matina Horner spoke eloquently of women's motivation for avoiding success; they fear it because they see it as incompatible with their role expectations as females.

The question of underachievement and how it is measured is particularly pertinent for gifted girls. Often, if judged by grades, the issue does not arise; however, grades often reflect teacher-pleasing rather than genuine knowledge. Girls seem motivated to do well for the extrinsic reward of the grade rather than because they really wish to learn; hence, as they move up the academic ladder, they are more likely to drop out of top-level classes. Parents and teachers need to be aware of these tendencies, and to praise girls for risk-taking as well as conformity. Each time a parent says , "What did you get?" rather than "What did you learn?", a clear message is given that the grade is the important thing. For gifted girls, underachievement is more a sense of options unexplored or studies avoided. Only when they can retain their "voices" and "follow their bliss" will such underachievement be eliminated. For too many girls, underachievement is the rule rather than the exception.

What can we do to try to change the attitudes and perceptions of gifted girls? Stereotyping hurts everyone, but gifted girls are among the most vulnerable. Parents can begin by encouraging independence in all their children, fostering a less traditional division of labor in he house, and making all children take some responsibility for household chores. Parents can also begin to think clearly about how they model gender behavior; daughters of working mothers are higher achievers and show positive adjustments on several different indices. Parents should also consider the toys they buy for children; girls might want Legos or chemistry sets; boys might want a doll. Again, it is difficult to generalize about all children, but a raised awareness of possible stereotyping might help children of both sexes. Parents should insist that their daughters take math during all four years of high school. They also must recognize that gifted girls need solitude as well as social interaction; encouragement to be "popular often backfires. They need to make sure they are not giving "mixed messages" to their girls; that it is all right to be smart, as long as one is not too smart to be "attractive." Both parents and teachers should be alert to signs of giftedness in girls from an early age; identification practices need to target this "endangered" group before they have become too adept at hiding their differences.

Teachers too, especially elementary teachers and math and science teachers, need a good deal of reeducation about stereotyping. Governments may pass laws to try to establish gender equity, but each adult needs to take responsibility to ensure that it is a fact rather than a myth. As *U.S. News and World Report* states in the August 2, 1993 issue (in discussing the Gender Equity in Education Act), ". . . Yet for all the signs of progress, a close look at girls' lives hints that many of the forces that inhibit them will not be easily countered with a new law or an experimental program . . . It is this pervasive cultural image of the 'good girl' that is perhaps the most powerful gear of the gender sorting machine, and the one that will undoubtedly prove hardest to shut down." Gifted programs should emphasize educational equality and career guidance, and all professionals in schools should be trained in identification of gifted students. All teachers must provide opportunities for girls to explore roles, experiences and activities that are generally reserved for boys. They must be proactive, offering opportunities to girls rather than waiting for them to ask. They should help all children become media critics. Even nursery school children can discuss favorite cartoons and sit coms, and almost all are exposed to videotapes and movies. Teachers and parents should again be proactive in discussing these works, asking questions about portrayals of women, realism of the characters, and willingness of the characters to take risks and try new things. Schools should consider the preferred learning styles of girls; they like to work in cooperative groups for projects, especially with one another. Yet too often if cooperative learning is instituted, the groups are designed for other reasons (equity, ability) rather than for girls' needs. The question of single sex classes for math and science is still new; however, it is worth experimenting with if large numbers of girls are dropping out of the top track in these subjects. Schools should also be aware of the characteristics of gifted girls, and how these differ from the characteristics of gifted boys. "Silent" does not equate with "dumb" or "average".

Taking a page from the Sadkers, teachers must ensure that girls are given equal time to express themselves, and that the feedback given to them is based on performance rather than conformity. Teachers could ask one another to observe teaching style, number of times he/she calls on males or females in the class, and level of questions asked to each. Girls should be encouraged to ask direct questions and make direct statements, rather than to rely on the tentative, questioning, approval-seeking approaches they tend to use. For example, a girl will say, "Let's go to the movies, shall we?" rather than, "I want to go to the movies." Such language makes it easy for others to believe she does not have a strong opinion.

Teachers and parents should also avoid rescuing girls. Girls should be encouraged to take chances in pursuit of a goal, and encouraged to ask questions and to discover information for themselves. They should be praised for their skills and successes, not for their appearances. They should be encouraged to pursue meaningful careers, rather than told to "get a job" until the man of their dreams appears. Teachers and parents should introduce their daughters to their own professions, and to women who love the work they do. Girls should also be encouraged to think of non-traditional careers. If they love math and science, every effort should be made to find women who are successful in these fields to serve as mentors. Both sexes should be exposed to non-sexist literature and to biographies in which women excel. Certainly girls should be encouraged to participate in competitive sports AND competitive academic programs, such as *National Geographic*'s Geography Bee and Academic Pentathlon and Decathlon.

Gifted girls, like all girls, are in danger of failing to reach their potentials academically, socially and emotionally. Much of what they learn about being female is contradictory to what they feel to be true; they must be affirmed in their expectations, their hopes and their dreams if they are to succeed.

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High Ability Girls and the All-Girls Math Setting: Do Teacher Interaction Patterns Change?

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Introduction

In 1973, Lucy Sells first identified mathematics as the "critical filter" leading to high level jobs (Sells, 1980). In turn, these jobs lead to high level salaries and economic power. Unfortunately, twenty-two years later, girls do not appear to excel at mathematics in the same proportion as boys. This may be a factor contributing to a disparity in economic power. The American Association of University Women (AAUW) has highlighted many issues relating to educational inequity in a report entitled How Schools Shortchange Girls (1992). Educational inequity is more critical for high ability girls because they provide the potential population for many future engineers, scientists, and physicians.

If one backtracks to find the point at which this disparity begins to emerge, several troubling issues arise. National Merit Scholarships are awarded to boys in higher numbers than to girls. These scholarships are based solely on achievement as defined by standardized test scores on which boys score high in greater numbers. By college, it seems the deck is stacked. Other important issues are: 1) a drop in self-esteem among adolescent girls which appears to affect learning, 2) an educational system which appears to favor boys' styles of learning, and 3) teacher interaction patterns which also appear to favor boys (AAUW, 1992; Sadker & Sadker, 1994).

Objective

Classroom interaction patterns which tend to favor boys have been documented by several researchers (AAUW, 1992; Eccles & Blumenfeld, 1985; Kelly, 1988; Sadker & Sadker, 1994). It is hypothesized that girls don't function as well in classrooms because of these patterns. It is reasonable to assume that academically able high school girls might have social abilities that would allow them to compete more fully for teacher attention.

The focus of this paper is to explore teacher interaction patterns with a group of academically able high school students (the majority of whom scored at the 95th percentile or above on standardized testing). The results reported here reflect the mid-point of a twenty-four week study and the results from eight observations conducted over that time period.

Method

Subjects

A subject pool of approximately 150 high school students participated in a 24 week gender-equity math study. The students were placed in pre-calculus classes at a public high school. Students spent 12 weeks in mixed-sex classes and 12 weeks in all-girls or all-boys classes. Eleventh grade students comprised the majority of the sample, however, 10th and 12th grade students were also included. The ratio of girls to boys was approximately equal.

Teachers

Two classroom teachers, one male and one female, participated. The students spent equal amounts of time with each. Both teachers had been sensitized to gender issues and were prominent in presenting gender-equity workshops to fellow teachers. Because of the teachers' backgrounds, it could be assumed they would be cognizant of interaction patterns favoring boys and willing to try to alter these patterns.

Setting

The pre-calculus classes were held in 80 minute blocks every other day. Both teachers structured their classes the same way. The first 40 minutes of class were spent in direct instruction; the last 40 minutes were spent in cooperative groups of four students each. All lessons, homework, and quizzes were kept constant.

Results

Cooperative Groups

The teachers reported that they tried to relate to the mixed, all-girls, and all-boys groups evenly, however, they were unable to do so. Both teachers indicated that they had to initiate and continue questioning with the all-girls groups, but not the all-boys.

The male teacher stated, "The boys keep asking me questions. They don't stop until they have their answers. With the girls, it's like...I have to keep the questioning going. They don't seem to want to know as badly."

The female teacher indicated, "With the girls..I have to push them...most of them. With the boys, they push themselves. They just demand answers. The girls are more easily satisfied."

Both teachers also indicated verbally that they liked teaching the boys because the boys engaged them and that was important to them. They reported feeling more validated as teachers when verbally engaged.

Teacher Interactions With Cooperative Groups

Male Teacher			
Mixed Group		All-Girls	
# of Interactions	Average Time Spent	# of Interactions	Average Time Spent
12	46.7 seconds	12	42.9 seconds
Female Teacher			
Mixed Group		All-Boys	
# of Interactions	Average Time Spent	# of Interactions	Average Time Spent
17	62.1 seconds	25	80.7

Quiz Administration

The teachers differed in their administration of quizzes among the mixed, all-girls, and all-boys groups. The all-boys group seemed to be treated in a more "businesslike" fashion and the all-girls group in a more nurturing fashion.

Prior to administering a quiz, the male teacher gave a three sentence explanation to the all-boys group. The mixed group received a twelve sentence explanation. When asked about the difference in presentation, the male teacher replied, "I know I treat them differently. I can't help it. I try to treat them the same, but I just can't do it."

The female teacher also presented quizzes differently. The same pattern was repeated. The boys were treated in a more terse fashion, while the girls were nurtured. When asked about the difference, the female teacher stated, "I just present it fast to the boys, so they can get down to business."

Lesson Presentation

The teachers appeared to present the lessons in almost the same manner among the mixed, all-girls, and all-boys groups. Because a large amount of material was presented in a short amount of time, both teachers presented the material in a straightforward manner. The mixed and all-boys classes asked more follow-up questions of the teachers than did the all-girls classes. In three of four observations of lesson presentation, the teachers had to end the boys' questioning, while the girls were finished with questions earlier.

During one class session, the male teacher informed students of registration options for next year. One option was for a math academy that would comprise three class periods. The all-boys class questioned the teacher for a longer period of time and in more depth about the purpose and structure of the academy than did the other classes. In the mixed group, all questions came from boys. When queried about the level of interest in the math academy, the male teacher indicated that only one girl had expressed interest, while the academy was expected to be filled with approximately 30 boys.

When asked about questioning patterns, both teachers indicated they called on girls less frequently. The male teacher indicated that the all-girls classes forced him to question girls more thoroughly. Not only did the girls know the answers, but they could easily participate with in-depth questioning.

Classroom Noise Level

In all eight observation sessions, the all-girls classes created the least classroom noise while the all-boys classes created the most. The mixed groups fell in the middle. Although the operational noise level of the boys was greater than the girls, it did not appear to affect work levels. All groups appeared to have approximately equal levels of academic engagement time.

Discussion

It appears that teachers who have been sensitized to gender issues may fall into the same interaction patterns as unaware teachers. Even though teachers realize they are treating students differently, it is extremely difficult to alter ingrained relationship patterns. This may provide an important rationale for implementing all-girls math and science classes.

Although high ability girls may demonstrate equal achievement with boys, the facility to ask questions and pursue answers appears to be more dominant in boys than girls. This questioning facility may be more highly weighted than it appears on the surface as boys may be reinforcing teachers for teaching. This may set up a pattern for obtaining more teacher attention.

Although lesson presentation may be virtually the same, the learning process may be approached more aggressively by boys. Even though the achievement outcome may be the same, the learning process may be of deeper and richer quality for boys than girls.

The nurturing behavior demonstrated by both teachers toward girls, may be subtly communicating to them that they need extra help. This may actually undermine confidence levels as the girls perceive themselves as needing assistance.

Conclusion

It appears that ingrained interaction patterns are extremely difficult to alter, even though high ability students could reasonably be expected to have more skill in obtaining teacher attention than general ability students. It also appears that ingrained relationship patterns are extremely difficult to alter, even when teachers are aware of their behavior.

In summary, research suggests that boys and girls have qualitatively different experiences in school and that these experiences may be more advantageous to boys. It is possible that restructuring classes may be one means to achieving equity.

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Gender Equity: A Lens for Examining School-to-Work

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Within the next ten years, women will comprise almost half the workforce, with women of color representing the greatest growth. Of the 54 million employed women in the United States, 75 percent work full time. Women, like men, work because they have to. Fifty-nine percent of wives in married couple families are in the workforce, bringing median family income to $48,169, compared with $30,075 for families without the wife in the paid labor force. Women who are single heads of households are in the labor force in even greater numbers and earn a median family income of only $16,692.[1]

Despite the high participation of women in the labor force, and while women have made substantial progress in obtaining jobs in high paying managerial and professional occupations, they are still over-represented in low-paying jobs. When comparing the median weekly earnings of full-time workers, women earn only 75 cents for every dollar earned by men ($381 for women and $505 for men).[2]

Encouragingly, the more education a woman has, the greater the likelihood she will seek employment. And, women and men with specialized technical training can expect to earn half a million dollars more in their lifetime than someone who is working at a low-skill, minimum wage job. With more families living in poverty—especially families headed by women—the nation needs to develop models of education and workplace support that offer women options and opportunities that enable them to achieve economic self-sufficiency and social efficacy. Ignoring this will push more women and their families into an endless cycle of poverty. School-to-work transition (STW) holds the potential to change this. Unfortunately, within the national discussion on school-to-work, very little has been said about the educational and social realities of the lives of women and girls, the barriers to females based on gender-role stereotyping and expectations, or how these issues can be addressed through STW.

Examples and Lessons of STW

In its broadest vision, STW opens up the educational system through partnerships with the workplace. STW can create access for students who have been locked out of the traditional routes to academic and economic success. STW can contextualize learning for all students; it can introduce students to a range of future employment options, including but not limited to careers in technology. It can provide teachers and students with a better understanding of the demands and excitement of the workplace. And it can provide opportunities for more students to enter and succeed in higher education.

For example, the newly developed Teach Boston program will help high school students focus on teaching careers through a combination of shadowing and tutoring experiences, summer jobs tutoring others, as well as by studying about education. Grounded in the classroom experience, students have the opportunity to see teaching as an evolving practice, one that is changing to meet the demands of the future. This program will result in a group of students who will graduate from high school with a clear focus and high expectations for themselves, who will attend college, and who will ultimately return to teach in a place where they bring a unique perspective on the neighborhoods and the needs of local students. This is as much a school-to-work program as one leading to a career in the biosciences or engineering and, like those, will ensure that students enter college with a degree of motivation and focus unusual among most college freshmen.

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[1] *Facts on Working Women*, No. 93. U.S. Department of Labor, Women's Bureau, June 1993.
[2] *Facts on Working Women*, No. 93

Another program, Choose Nursing, links students from one of Boston's high schools to a local hospital. Designed to increase the number of nurses of color, students participate in the daily life of the hospital, they work in the different departments, are mentored by medical staff, discuss medicine with patients and staff, present information to their classes, and take the requisite math and science classes that would prepare them for a career in medicine. Their teachers confer with hospital staff to better link math, science instruction in the classroom to the reality of the medical field. This, too, is the essence of STW—using the world of work as the laboratory in which to learn and integrating this with the school curriculum. It is not low level job training, but a way to expand students' ideas about the world of experience.

Another link between "real" world learning and academic achievement is exemplified in the experience of a local chemistry profession who was asked by the American Chemical Society to design a high school chemistry course for non-college bound students. Rather than have students memorize charts or do "college prep" work, the professor thought he would make chemistry interesting. He built the curriculum around experiments related to the use of chemistry in the communities where the students lived. The result for the students—better scores on the Advanced Placement tests in chemistry than the students enrolled in college-prep chemistry. By making chemistry fun, interesting, and worth learning, this professor did in one class what STW can do in all—make learning worthwhile.

These programs can form the base for the systemic reform inherent within STW and carry within their design several important lessons. First, different students learn in different ways. Some learn better in more traditional classrooms where learning focuses on reading, writing, and conversation. But many other students learn better through experience. They learn by doing, whether it is applying chemistry in a neighborhood-based curriculum or teaching by tutoring a younger student while studying about education or performing tasks in a hospital that relate directly to math and science. All link students—whether they will go to college or directly to the workplace—to a broader sense of the workplace, of the relevance of what they are studying to their lives beyond high school. For many students, these experiences provide the first glimpse of a range of career possibilities never before imagined.

School-to-work remains a hotly debated issue. Supporters see this as a way to involve business and industry in redesigning education to meet the needs of the future, while critics worry that business and industry will define education to meet their employment needs rather than to meet a full range of student needs—economic, social, and civic. While many hold a vision of STW as a new concept in education reform, others describe it as a way to get "the forgotten half" into the workforce. While some see STW as an opportunity to broaden access to higher education for many students of color and poor students, others view higher education solely in terms of community colleges and technical programs. Those concerned with equity cannot afford to wait; it is critical that equity concerns become central to this national debate. We need to enter the debate, offering the lessons learned in other equity arenas, and becoming full partners in an effort to remove educational and economic barriers for women, people of color, and people with disabilities.

The School-to-Work Opportunities Act

The School-to-Work Opportunities Act, or Federal Public Law 103-329 (H.R. 2884) was signed into law in May 1994. Implications for gender equity are woven throughout the

Act. For example, the intent of the Act is "to increase opportunities for minorities, women, and individuals with disabilities, by enabling individuals to prepare for careers that are not traditional for their race, gender, or disability." "All students" are defined as both male and female students from a broad range of backgrounds and circumstances, and "career guidance and counseling" programs are to be those which develop career options "with attention to surmounting gender, race, ethnic, disability, language, or socioeconomic impediments."[3] Activities of the STW program are jointly administered by the departments of Labor and Education, in an effort to more closely link education and workplace in the development of the state projects.

Currently, eight states have implementation grants: Kentucky, Maine, Massachusetts, Michigan, New Jersey, New York, Oregon, and Wisconsin. All other states have planning grants to help prepare for the next round of funding. Recent budget cuts have reduced funding for STW programs and for a number of education programs, including Title IV, which funds the state sex equity consultants, and Tech Prep Programs. Although the future of STW is unclear, the School-to-Work Opportunities Act remains both as a guide to a new vision for education and as a mandate to meet the needs of all students, with a specific focus on gender equity.

States and localities can build STW systems upon existing successful programs, such as youth apprenticeship, tech-prep education, cooperative education, career academies, and school-to-apprenticeship programs. The Act encourages the active and continued involvement of local business, education, union, and community leaders. The Act defines successful completion as a high school diploma, a certificate or diploma from a post secondary institution and, if appropriate, an occupational skill certificate. Each STW program must include three components:

- work-based learning that provides a planned program of job training or experiences, paid work experience, workplace mentoring, and instruction in general workplace competencies and a broad variety of elements of an industry
- school-based learning that provides career exploration and counseling, instruction in a career major, a program of study based on high academic and skill standards, at least one year of post secondary education, and periodic evaluations of student's academic strengths and weaknesses
- activities that coordinate involvement of employers, schools, and students, matching students and work-based learning opportunities and training teachers, mentors and counselors.[4]

Equity and STW

As states and localities develop STW plans and programs, several concerns have surfaced about equity and diversity, including:

- the ability of systems to recruit, retain, and help girls, males of color, students whose first language is not English, or students with disabilities succeed
- whether STW channels students to high-wage technology-related occupations with little or no access to other careers such as law, education, or the arts
- whether a focus on the local job market needs may not take into account the rapidly changing economy or the mobility of individuals within the United States
- how, as a new partnership between education and employment, do STW programs foster a sense of mutuality, guaranteeing that this movement is not driven solely by the

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[3] School-to-Work Opportunities Act of 1994

[4] *Legislative Fact Sheet,* U.S. Department of Education, Office of Vocational and Adult Education, 1993.

needs of business, but rather becomes a mutual partnership in which both education and employment are transformed

Furthermore, since STW is grounded in successful vocational education and apprenticeship programs, there may be a misconception that it is yet another vocational education program or that it is not for all students. Unless this is challenged, we risk perpetuating old assumptions or stereotypes that prevent the full participation of all students. Integrated into the life of the school, STW programs must meet the needs of all students, not just those perceived as being vocationally or technically oriented. If a program is perceived of as one for "the forgotten half" it will become another tracking system, despite the best of intentions. Similarly, in discussing "all students" STW programs can easily overlook the needs of girls.

The School-to-Work Opportunities Act acknowledges this. Beginning with the initial planning for STW, states are required to include the gender equity component. For instance, state implementation grant proposals must identify how the state sex equity administrator will be involved and how teachers, administrators, employers, and others will be trained to address the counseling and training needs of women, people of color, linguistic minorities, and individuals with disabilities. This provides the opportunity to introduce successful models developed in vocational education, math and science, and in gender equity as excellent resources, not simply to raise the questions within STW but to offer strategies that work.

Gender Stereotyping and Career Expectations

Much of the early work in vocational education and nontraditional education addressed deeply held stereotypes about appropriate careers for males and females. The materials developed under grants from the Women's Educational Equity Act (WEEA) Program focused on confronting and shattering these stereotypes. Hundreds of programs around the country, supported by affirmative action and Title IX, pushed for the inclusion of women and girls in nontraditional careers. These careers—in the skilled trades, crafts, engineering, and construction—were opportunities for high wage, flexible careers.

Recently, similar concerns have surfaced about the participation of females in mathematics and science related careers. Math and science are often the key to future economic and social well-being, opening the doors for careers in technology and the professions. Unlike nontraditional careers, the need for advanced mathematics is now often an accepted reality for girls, their teachers, their parents, and future employers. Girls are taking more math and science classes in high school, are earning more degrees in related fields, but women still do not choose math and science careers. STW can avoid mistakes by building on the existing models for gender equity that have been developed in both NTO and math/science programs.

Nontraditional career programs and math/science for girls initiatives also have lessons to share with STW about the impact of gender-role stereotyping. Gender role stereotypes, on the part of students, teachers and counselors, parents, employers and work colleagues, has long played a role in determining whether students see a career as open and inviting or as unattainable and hostile. Expectations that certain careers, like construction, mathematics, or bioscience, are "for boys" while other careers, like teaching, nursing, or administrative support are "for girls" are often unconscious or unspoken. However, they continue to shape the teaching and counseling methodologies of schools, guide parents to push boys in math and science, and shape a workplace culture that does not support women in their dual roles as workers and parents.

This dual role most women play is often unrecognized by employers, colleagues, teachers, and counselors. But it is often a major consideration on the part of women and girls as they make career choices. Despite significant participation in the workplace, women are still expected to be the primary nurturer within the family. Recent surveys indicate that even in young two earner households, women do the majority of household and child care tasks. The expectation that this "women's work" should not affect work continues to guide the structure in the workplace as well. Women often must choose between jobs that pay less, but enable them to have the flexibility to be home with children after school (since few affordable day care options exist) or to take jobs that require significant involvement with better pay, but risk penalties. The lesson of the recent spate of custody hearings where men sought (and gained) custody of their children because they claimed the mother was working too much has also not been lost on women and girls.

These messages continue to tell women that the workplace and society frown on their full participation and, until we begin to change the expectations not just of female students but of their male counterparts, teachers and counselors, and employers, no program will change the economic reality for most women. The workplace must also change to reflect the changing needs of workers and become both supportive of women and "family friendly."

STW and the States

Since the states are the primary movers for School to Work, it is important to examine how they are viewing and implementing gender equity in their state plans. We are in the process of compiling data on gender equity in school-to-work, based on review of the state plans and on interviews with state sex equity coordinators. While the potential for positive impact of female students can be seen in many of the plans, there seems to be less consideration of gender equity within the implementation of state activities. Although this research is still underway, we can point to some examples.

In some states, such as Oregon, the state sex equity coordinator reports full involvement in the STW initiative. Building on previous work in gender equity, the state is developing regional gender equity teams, cadres of trained individuals who have expertise in all reform and will help implement programs and build capacity. In states such as this, where there is a commitment to gender equity, there is already a move to consider what needs to be done on the elementary and middle school levels to build the foundation for making choices about the futue.

In other states, however, equity specialists do not find themselves invited to be active participants. Many, in fact are not invited to participate at all. As one state coordinator said, "I'm not linked to STW at all. I've asked to participate but am told that "all students" will participate and that there are 'too many' people on the advisory council now." Her concern was echoed by another state coordinator who said he "has not heard from anyone about any of the meetings that are listed in the planning grant." He, like colleagues in other states, was concerned that "there needs to be a stronger staff development component so that all educators understand the socioeconomic and gender issues in order to confront these barriers." This staff development needs to extend beyond educators to the other partners in the STW process.

While many of those interviewed felt positive about the vision of STW, agreeing that their states were seeing this as "not just voc ed, but something that extends beyond to include kids in all areas" they continued to voice a concern that STW was perceived of as a labor market issue rather than an education issue. If this perception persists, the promise of STW will not be realized for STW is a collaboration between education and labor, designed to restructure education in fundamental ways so that all students do have equal access and opportunity for academic and economic achievement.

If school-to-work programs are for everyone, programs need to pay particular attention to the needs of individuals within specific groups—students who are female, are of color, have disabilities, or who speak a language other than English. We are at a crucial point in the development of school-to-work, a point where we can draw together the best learning and experience from education, equity, community, and the workplace. As we bring this expertise together, we can we evolve a new model, disaggregating the data, evaluating our efforts, and refining the work in progress. A rigorous look at how the program works for all students—for each student, including each girl—provides the opportunity to build a stronger model.

Involving the Equity Community in STW

Equity specialists and advocates need to be assertive in creating a role within the STW system, one in which they can help shape the conversation, provide insights into the needs of specific groups of students, and draw on the strategies and programs that have been successful in other arenas. As new collaborations between education, business, and community, many STW groups may not understand the connection of gender equity with STW. Equity advocates need to seek out key individuals within STW for discussions on how gender equity fits and how it will help enhance the program for girls and boys. As in the beginning with nontraditional careers, we need to marshal the argument, with facts, state data, and with examples of successful models. We need to offer specific help to the state or local planning group, spelling out the benefits for officials.

Key to understanding the implications of gender equity and equity for all students within STW is building a dialogue within the STW community that incorporates the rich expertise and experience of work in nontraditional occupations, math and science for girls, and other equity programs. As states and communities begin planning and implementation, equity advocates can *raise a series of key questions that can help infuse equity into the process*. Advocates can *become partners in the process*, offering for example, the organizational involvement of AAUW, the Girl Scouts, or others who have expertise in the specific needs of girls and women. We can *begin a public discussion on STW and gender equity*, organizing public events, writing articles, participating in media events, presenting at parent organizations, the Chambers of Commerce, or the local Private Industry Council. We can *reach out to those in business and industry who have made a commitment to equity in the workplace* and who can articulate the benefits of equity and diversity in our global world. We can *broaden the discussion of STW within education to include all disciplines and departments*. And we can *share the lessons of equity in math and science, in vocational education, in higher education* with others who may just be starting to think about this issue. School-to-work holds a great deal of promise for the girls and women of this country, but only if we accept our responsibility to make sure that gender equity is part of every consideration.

Women as Administrators--Women as Teachers:
The Enduring Principles and Practices of Professor Lois Choksy

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Although traditional approaches to educational administration and leadership studies have focused on techniques of effective management, there has been a recent move to consider the "educational" implications of this field (Evans, 1992; Greenfield, 1993). This paper, in reporting initial findings from a qualitative case study, examines the significance of teaching to one woman's administration of a university department and points to connections between the two roles. Professor Choksy, head of a department of music in a western Canadian university, demonstrates a "pedagogically informed" and innovative leadership, one strongly motivated by her own school experiences and reinforced over many years of teaching and continued scholarship. Innovations, described below as successful by Choksy and colleagues alike, include the instigation of faculty committees for faculty assessment, the sharing of pedagogical expertise, the Head's availability to faculty, and her "open book policy" in financial matters. Each of these administrative tactics presents a challenge to existing structures of departmental "duties" and the customary expectations of leadership.

Point of Departure. Traditionally accepted knowledge about organizations in North America, following models of business, the military, and public administration--and borrowing from behavioral psychology--is grounded firmly in assumptions of modernity. It has been assumed, for example, that people think and act rationally to harness technology in controlling nature and advancing human projects. A steady growth in bureaucratic forms of organization has accompanied the emphasis on rational and technological thought and action. This tendency was noted and described by Max Weber (1968) and other pioneering sociologists who, while applauding the efficiency and effectiveness of bureaucracies, warned against their alienating features of hierarchical roles, narrow specialization, strict adherence to rules and regulations, and depersonalization. Weber and later theorists (e.g., Rizvi, 1986; Ferguson, 1986; Franklin, 1990) warned, moreover, of the dichotomizing tendencies of bureaucracy whereby ends are separated from means, facts from values, and public work from private lives. Franklin sees each of these separations as contributors to the steady downgrading of personal experience.

In educational settings, we can trace the bureaucratic impulse in divisions between administrative and pedagogical duties, the isolation of disciplines--especially in high schools, colleges, and universities--and the separation of institutions from their communities. There are signs that schools are questioning and rejecting the ethos of separation; at elementary levels, for example, school personnel have started to embrace models of cooperation, collegiality, and curriculum flexibility. Early models, however, have met limited success. In certain cases, they have been criticized as manipulative and insensitive to the well-being of teachers (Hargreaves, 1994; Tucker, 1993) and, in the case of curriculum change, as adopted unreflectively and for the sake of change as an end in itself (Holmes, 1991). Manipulation occurs here as teachers are "given freedom" to implement the ends--i.e., the plans--of others.

Regarding leadership, feminist writers and curriculum theorists refer both to the "teacher-as-leader" and to the "leader-as-teacher" (e.g., Rosenholtz, 1989). It is hardly surprising that the links between pedagogy and school leadership begin to emerge as women assume a stronger voice in the theory and practice of administration for they commonly bring to the job from ten to fifteen more years of teaching experience than do men. In recent Canadian studies, researchers have pointed to a new kind of leadership emanating from women's involvement. While cautiously avoiding essentialist or causal claims about biological differences in the leadership of men and women, these researchers provide evidence of differences in experience and expectations (Reynolds, 1987), in concepts of justice and community (Harris, 1995; Young, 1993), and in practice (Fulton, 1993).

Locating the Study. This paper records the first stage in a larger study in which five women scholars will examine the meaningful action of six women educational leaders--in school, college, and university settings--with particular attention to the breakdown of existing structures of organization and their replacement by "other ways of doing things". My interpretation of Professor Choksy's administration focuses on the valued meanings and strongly held beliefs that Hodgkinson (1983) claims to be the crux of leadership practice, that is, "philosophy-in-action".

Purpose and Method. Through a study of values underlying principled action, I seek an expanded understanding of the significance of teaching to the manner in which it is administered. I also wish to explore ways in which the two areas of action can be incorporated successfully and, finally, indicate new directions for the planning and teaching of educational leadership in universities. With an assumption that a situation may be understood most clearly in the words of those at the grassroots of action, the study is hermeneutic in design and descriptive and interpretive in method. The hermeneutic will be achieved fully over the next two years through a series of semi-structured and informal conversations with the major participants. For this paper, Choksy's attitudes, beliefs, and values are explored concerning teaching and the administration of her Department.[1] The perceptions of Choksy are cross-referenced, informally at this stage, by those with whom she works.

The interview with Choksy was audio-taped and the transcript returned for verification and clarification of meaning. In this case, where the participant is well known, I use her actual name. Although I refer to the customary "interview", the mutual construction of meaning between researcher and participant occurs more often in the spirit of dialogue or, simply, as informed conversation (see Oakley, 1981). To further remove the conversations from any claim to objectivity or non-involvement, and because ideas are discussed between colleagues, we will be sometimes simply "Carol and Lois".

Lois Choksy, Today and Yesterday. Professor Choksy is a tall, handsome woman with a commanding presence. Her personal life and her work are together infused with a common passionate focus--to bring the beauty of music to all children through any means she can manage. For her, the love and the understanding of music are inextricably intertwined with skills of performance, reading, and the ability to express meaning in symbolic form; moreover, they depend on a diet of "the finest quality", defined as much by her aesthetic values as by the received canon.

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[1] Sources of evidence for the full study will include observations of classroom and administrative action, documents and reports, books authored by Choksy, and an unpublished masters thesis (Bisset, 1992).

Choksy's energies have for many years been directed to these ends through the means of school and university teaching, authoring widely-acclaimed pedagogical texts, lecturing nationally and internationally, organizing and administering a summer institute for teachers, contributing to what she considers to be "significant" university planning committees and now chairing her Department. Teaching provides the common thread running through these activities. This she does twice weekly in a public school as part of a practicum for prospective teachers and for a two-hour session with musically "talented" children from the local Conservatory of Music. Throughout her 20-year career in universities, she has maintained that the school constitutes her "research lab". With successive classes of children, she tests her pedagogical theories, rejecting some and refining others. As many of Choksy's pedagogical approaches are committed to print, some critics have spoken of her resistance to change and her "one best way". My observation of her teaching leads to another view, that Professor Choksy innovates constantly, adjusting and testing her classroom approaches in the process. As she once said of tests to a University class, "I don't mind telling you the questions in advance. After all, the questions remain the same; only the answers change". This exemplifies a flexibility of approach that I will show extends to Lois' administrative actions.

Administrative Initiatives. Before meeting with Lois for the interview, I asked several faculty members about recent changes in the Department. The new practice for committees of faculty members to assess the year-end reports--which all faculty are required to write about themselves--seemed to assume primary importance for everyone. Previously, Heads of Department took responsibility for such assessments. Not unexpectedly, the practice had produced such "organizational disruptions" as suspicion of the Head's motives, accusations of favoritism and, in one case, an outright refusal to write the report. Moreover, faculty tended to become balkanized and defensive of their teaching turf and performance areas. The entire procedure had become a loathsome experience for faculty and for Heads alike. When I asked Lois about her new approach, she admitted that, despite "strong resistance" initially, this innovation had proved the most rewarding from her point of view. She explains the move from "head review" to "peer review":

> Normally, a Head writes all the annual assessments and assigns points. One of the problems is that faculty have never learned how to fill out their annual forms in a way that is most favorable to them. I thought that it would be helpful if they all had to read all of these forms. So I have established a rotating committee. Those five [on the committee this year] now know! Everybody will [have a turn] within four years.

Although Lois sits in on all meetings, she does not exercise her vote. Her twin objectives here are that faculty members become increasingly conscious of their own strengths and improve their expressive skills. Another purpose is that faculty "have a better sense of what their colleagues are doing. One of the perceptions that many people have is that they are doing more than anybody else. They need to have an understanding of what the general level of productivity is among their colleagues". Finally, Lois would like to see the faculty, as a whole, "cut down on the number of appeals" concerning their reports.

She was unsure if this last objective was realized this year but, "by the time they have all been through the process, it will".

When I asked one committee member what the experience did for him, he admitted that "next time my own will be much better.[2] This way we got to learn the process. Also, I got to appreciate other people's work much more." This faculty member, therefore, realized Lois' objectives for personal and professional development and increased collegiality.

A second initiative speaks to the entrenched principle of "faculty autonomy" or, as enacted often, of teaching in isolation. With strong roots in school practice, Lois realizes that faculty members--herself included--are learners throughout life and, therefore, will benefit from

> pedagogical help. This year, I observed every single teacher in the Department and I will do so again next year. I wrote up all the lessons I observed and I kept a copy and gave them a copy. And we discussed [any problems that arose]. In a couple of instances, I gave very specific teaching suggestions.
>
> **Carol**: Did you really? This is exactly what you have been doing all these years at St. Rita's.[3]
>
> **Lois**: Well I just thought that I should keep doing it. There has been much that was praiseworthy, and I've said so.
>
> **Carol**: Has it worked?

This question led Lois to tell about a young sessional teacher of musicianship who, after implementing a couple suggestions, said "it worked like magic. He said he felt like he had been given the magic key!" Although Lois does not insist on a discussion of pedagogical procedures, her handwritten note "always says 'Let's talk about this if you want to'. Now some do and some don't". Regardless of any single faculty member's willingness to discuss his or her teaching at this point, Lois hopes that people, by her example, will begin to share with one another their successes and failures more readily.[4]

A similar sharing may be noted, as well, in Lois' "open book" policy regarding financial matters. Because of current provincial policy regarding the funding of post-secondary education, the University is suffering severe economic cut-backs, possibly more dramatic than in any other part of Canada. Nevertheless, Lois maintains that faculty are "absolutely cognizant of the budget situation. Each of the performance ensembles now has its own trust account. While I have to sign [cheques] still, [the faculty member] has to sign them too. I want them to know about and have responsibility for their own funds". Such openness in the face of a serious financial situation appears to have brought faculty together, rather than divided them in the traditionally accepted "fight for scarce resources". In terms of power, one faculty member explains that she has "put the decision-making in our hands. |Each ensemble| is recognized as a separate group with unique problems". He adds that,"contrary to what some might say, she's not doing it to run away from decisions". Summarizing the personal impact of such action, another faculty member told me that he "can come out of a meeting with her, not having gained the objective sought, and still feel good about the situation and about myself".

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[2] In checking the outcome of assessments one year later, this associate professor reported that his award was one of the highest.

[3] See Bisset's (1992) detailed description of the two-directional modelling and notated observations between Choksy and her students during the St. Rita School practicum.

[4] Lois spent several years in Hungary where an open-door policy among teachers was accepted practice and clearly understood by all as a necessary route to improved teaching.

My last example of unusual openness concerns items that customarily fail to make it to departmental meetings, yet circulate widely as informal conjecture. To avoid damaging gossip, Lois begins almost all formal meetings with such "off the record" items for she considers that "there are always things that need to be aired and rumours to be tackled head-on". Lois then gives an example of a potentially serious rumour about a program cut that had been circulated through an erroneous media statement. A faculty member, in describing this tactic, uses the metaphor of the Head "opening up boxes".

Comment and Discussion. Several aspects of Choksy's approach to faculty bear striking similarities with her school practice. First, she demonstrates a genuine belief in the talents and wisdom of her colleagues, reminding me of the responsibility and trust she showed her grade 6 students. Given this kind of support, it is no more surprising that faculty respond cooperatively than that the school students became musically literate. In the school, we see a leader with a vision who has the will and the skill to convince children and other teachers of her project. In the university, this leader cooperates with respected "fellow professionals" to help them fulfil their visions of excellence.

Then too, Choksy brings the excitement of pedagogical excellence to her administrative tasks. As a highly skilled and reflective teacher, she leads faculty by example. When asked if her classroom-based research kept her in the schools, she replies without hesitation, "No, it seems to feed me. I just think that ! stay alive by teaching. I can go into a classroom tired and come out feeling wonderful". Choksy appears to find a similar reward in the incremental improvements that take place in the university setting.

Choksy's knows, however, that there are risks involved in innovative strategies, be these at school or in the department. She would "have little credibility" among her students without her pedagogical modelling. She "can give |the students| a series of steps" but the modelling shows that she "doesn't follow those steps always. They see that teaching isn't that prescribed, that rigid. Sometimes things don't work. And they need to see that too". With parallel risks, faculty members may stumble in their financial planning, their teaching, or in their evaluation of peers. Nevertheless, risks imply what one faculty member describes as a "partnership between the learner and the teacher". In comparison, he notes that "many of the old school operate in black and white, with secure rules and regulations. Taking part in a partnership might be threatening". This man believes that the changes are taking place "because she's a pedagogue".

We see in Choksy an example of the radial leadership describes by Helgesen (1990) and others who write of women administrators. This leader appreciates being part of the action and maintaining contact with her colleagues, both formally and informally. Most importantly, though, we have here a leader who prepares others for the role. By involving faculty in their own professional development and in the assessment of their peers, and by allocating financial responsibility to each person, Choksy both asserts and fosters leadership. Moreover, she demonstrates a trust in the personal experience that each faculty members brings to the organization. Each action represents a challenge to the "way things were done round here". The hierarchical pyramid of leadership gives way to a wheel of responsibility. Fear of failure--or of being seen to fail--is replaced by a risk-taking that usually, though not always, pays off. These are marks of good school teaching. Not less so they appear to be signs of successful administration.

As hierarchies crumble and the old rules and regulations give way to fresh practices, a new vocabulary must be forged. This study reveals ways of leading that, as part of a secondary discourse (Ferguson, 1984)--that of women, have not received the attention their successes warrant. A new and evolving discourse about cooperation, inclusion, and openness, welcomed in this case by men as well as women, denotes structural changes that are affecting an organization in its hierarchical arrangements and isolated programs and practices.

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The Family Romance and the Student-Centered Classroom

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Buried in the 1993 *Chronicle of Higher Education Almanac* is an essential piece of information: fully 30.9% of male and 21.3% of female first-year students "agree strongly or somewhat" that "married women's activities are best confined to home and family (15)." How do such attitudes affect the authority of female professors who share the age-group or status of "married women"? To students, the "woman/scholar" occupies the body, age-group and status of a "Mother," but operates in the public sphere of a college or university - traditionally the territory of the metaphorical Father, the intellectual mentor who prepares his youthful charges for adult participation in the public sphere. This bizarre hybrid resembles neither the nurturing Mother of students' primary- and secondary-school experience nor the demanding and learned Father whom they expect to encounter behind the lectern. Consequently, students taught to believe that women belong in the private sphere are confused; how should they respond to a female professor? Should she be respected and obeyed as an authority - that is, an educated, articulate professional? Or is it OK to despise and even undermine her as an impostor?

Students' confusion about the authority status of female professors stems from a variety of factors related to basic gender stereotyping. Here, however, I would like to focus on how the implementation of a "student-centered" pedagogy further undermines a female professor's classroom authority. Many female professors, especially those who identify themselves as feminists, practice student-centered pedagogy because it is fundamentally democratic, designed to empower rather than to indoctrinate students. Students, however, are likely to perceive decentered authority models as "no authority at all," a deviation from the lecturing norm and possibly evidence of the professor's incompetence. Consequently, the female professor who opts to use student-centered pedagogy further compromises an authority that many of her students already view as shaky.

The female professor who practices student-centered pedagogy faces a double bind: her refusal to assume absolute authority over her students threatens to undermine what little authority she already possesses. If she opts to buttress her shaky authority by adopting authoritarian pedagogical models, she faces another double bind. By indoctrinating students rather than involving them actively in the creation of meaning, the female professor threatens to recapitulate the dichotomous authority structures that have been used to exclude women like herself from the academy. So what should the female professor do? Theoretically, she should be able to subvert the double binds by striking a balance between the stereotypic pedagogical extremes of permissiveness and tyranny, borrowing freely from both traditions while leaning heavily on neither. In my experience, however, merging the two pedagogical styles (for example, by combining lecturing and collaborative learning) has succeeded only in upper-division courses, where students tend to bring more maturity, motivation, and expertise to the table.

In lower-level courses - particularly introductory writing courses - my attempts to balance or combine pedagogies have been less successful. They generally meet with continued inappropriate challenges to my authority as well as unusual levels of resistance to the goals and process of the class. Though frustrating to teach, these courses have taught me that students' resistance to female authority and student-centered teaching may have as much to do with psychological family dynamics as with broader patterns of gender stereotyping. The dynamics of my students' resistance to my authority and pedagogical style strongly resemble the psychological dynamics of the Freudian/Lacanian "family romance," a phenomenon that links children's successful transition into adulthood - a realm of abstract symbolic discourses - with their ability to reject or repress an archetypal mother who represents prelinguistic consciousness. This paper explores this dynamic, first by outlining the gendered implications of student-centered teaching and the family romance itself, then by relating my students' behavior and comments to these two paradigms.

My students are deeply habituated to what Paulo Freire has called the "banking" epistemology of education, the model that dominates American higher education from the SAT to the GRE. Freire significantly uses a sexual metaphor to describe his "banking" paradigm: knowledge is an object possessed by a male teacher who impresses it on students who must simply sit there and "take it." Ideologically the process models indoctrination if not intellectual rape, and is an apt paradigm for the way one group of people learns to dominate another. Certainly it is both hierarchical and patriarchal.

Student-centered pedagogy, in contrast, is intrinsically anti-hierarchical, an openly politicized strategy for empowering the least vocal members of a group. As Frances Maher points out, student-centered pedagogy is designed to involve "students in constructing and evaluating their own education. It assumes that each student has legitimate rights and potential contributions to the subject-matter. Its goal is to enable students to draw on their personal and intellectual experiences to build a satisfying version of the subject, one that they can use productively in their own lives. Its techniques involve students in the assessment and production, as well as the absorption, of the material. The teacher is a major contributor, a creator of structure and a delineator of issues, but not the sole authority."

Ideally student-centered pedagogy encourages students to help create meaning in the classroom. This goal, however, often seems counterintuitive to students habituated to the banking paradigm. In student-centered classrooms, where authority become fluid, both teaching and learning become improvisatory and contingent. Questions about evaluation arise on both sides: how, for example, should professors measure students' progress, and how should students fill out computerized teaching evaluations that ask them to rate the professor's "lectures"? What information or skills are important, and how will students be tested on them? How will expertise be recognized in the classroom? How will students learn to judge the good or true from the bad or false? At what point, if ever, will the professor - that "creator of structure and delineator of issues" - take charge and "cover" material monologically?

These questions should and can be negotiated between teacher and students as a matter of course. In practice, however, they require a constant rethinking of banking-paradigm pedagogy, including issues of power and authority. Though I would like to believe that students want to be stimulated and transformed by student-centered teaching, my students are ambivalent about liberationist pedagogy. Many prefer the banking system, which is predictable and allows them to remain intellectually passive and emotionally detached from learning. Many resent the level of responsibility and involvement student-centered teaching requires of them. Consequently, student-centered classrooms, particularly writing classrooms, are hardly utopian, but fraught with resistance and rebellion. Students quickly discover that they can alter the progress of a student-centered class by withholding participation, refusing to work, or insulting the professor. Furthermore, resistance and rebellion are difficult for the teacher to handle because of the putatively cooperative nature of the enterprise. In the "banking" classroom the professor is armed with The Grade, which can be wielded as a weapon against reluctant, lazy, or insubordinate students. But since student-centered teaching offers students options instead of absolutes, they know that their response - no matter what it may be - must be honored.

My students respond to the decentering of authority in the student-centered classroom in three primary ways. Some accept it initially in good faith, agreeing to participate and to concentrate on acquiring skills rather than information. Others tune out, participating marginally throughout. Still others rebel, attempting to restore the familiar "banking" paradigm they prefer. Most proceed through these positions in stages as the semester proceeds. But most of my students, though initially attracted by the course design, ultimately reject the methodology ostensibly designed to "liberate" them. This rejection stems from their epistemological assumptions about both education and gender. Because they define authority as absolute, oppressive, and masculine, a woman assuming a position of power must be masquerading at best, unnatural at worst. Student-centered pedagogy ironically throws this into relief. Not only does a woman lack any real authority to begin with, but by running a student-centered classroom she tries to give away her "lack" to the students. (To them this looks like a disease disguised as a gift.) Neither a female professor nor other students, according to their paradigm, has access to the symbolic order they equate with formal education. Consequently, what could possibly go on in a student-centered class that could be of use to them now or after they graduate? Why should they listen to me or to each other?

My students' epistemological prejudices are exacerbated by their collective psychological moment: I have not used the word "familiar" naively to describe their unquestioned acceptance of the primary of "banking" pedagogy. My 18-to-22-year-old students are literally in the process of attempting to separate from their primary-caregiver mothers. Their mothers, along with surrogates like nuns and elementary-school teachers, are the only female authorities my students have ever known. (The other women they "respect" - actresses and models - are conveniently mute and thus possess only a specularized kind of sexual power.) Products of a culture that refuses even to call child-rearing "work," few of my students are prepared to accord authority to women who nurture and instruct children, and they are ready to enact their resentment towards and fear of such women onto their female professors in the form of transference. Furthermore, these students are attending college in pursuit of entry into a formal manifestation of the symbolic order - the academy - a realm of specifically patriarchal power grounded in language. (It is significant that the Oedipal drama plays out most dramatically in my writing courses among students whose writing skills are painfully underdeveloped.) Traditional-aged students manage their transitions from a nearly pre-linguistic reliance on their mothers to entry into the powerful, word-wielding (that is, word-writing) world of their Fathers by forcing me to enact both corners of the triangle. This identity-transformation - a transformation uniquely facilitated by my ambiguous status as woman/expert - allows students to play out their Oedipal conflicts and to enforce their and my entry into the phallogocentric symbolic order with a vengeance.

The drama that is played out in my student-centered classrooms closely echoes the family romance. A sketch or outline of the process looks like this: early in the term, I am their all-loving, accepting mother who is interested in what they have to say and does not enforce knowledge autocratically upon them. Then, once the first grades or conflicts arise in the class, they begin to resent this motherly stance, acting out in ways that beg punitive responses - refusing to participate and complete assignments, for example - actions that force me to enact the part of the phallic mother, the punitive half-possessor of the phallus. Then, often through outright acts of insubordination, they force me to enjoin rules of the banking paradigm, transforming me into an imitation father who withholds, punishes, demands, is "objective" and objectifying. Certainly the logic of the American college classroom enables this; the law of the father is embodied in that most potent of classroom signs, the grade - the symbol of phallogocentric mastery.

Most of my students initially embrace the maternalistic aspect of the class's subjectivist epistemology. Consciously or unconsciously they recognize that an inclusive pedagogy reflects a feminine or feminist epistemology, a nurturant ethic Sara Ruddick calls "maternal thinking." Initially many are attracted to this apparent anti-structure, relieved to escape the "banking" paradigm and ready to return to a childlike state of unselfconscious exploration. They report: "this is the only really fun class I have." "I never know what's going to happen in here, so I don't get bored." "My ideas are valued here." Some say they feel newly free to speak and write. Many, however, remain silent, watchful: unsure of my expectations and accustomed to betrayal by authorities, they fear everything might vanish instantly; they refuse to become subjects in some eccentric pedagogical experiment. At this early point in the term, the female professor is still "mother," the other-directed, nonverbal (silent, speech-honoring) parent who affirms feelings and intuitions. My students enjoin me to nurture their sometimes regressively narcissistic subjectivity (which arises as endless pointless whining about and refusing to read challenging texts, repeated requests to sleep and eat disruptively in class, obsessive preoccupation with personal problems, inability or refusal to focus on a text or issue). Since language exists in this "stage" of the student-centered classroom, I hesitate to identify it with Lacan's imaginary, but My students' emphasis on "feelings" rather than "thought" when they talk about the class is surely significant. So is the student-centered class's emphasis on collaboration, which partly effaces or engulfs students' emotional and intellectual boundaries. To my students, the "learning" produced at this stage has little clear ownership or definable form - as one student put it, "not things you take notes on."

The moment at which learning becomes attributed, owned, marked (specifically with students' names and grades) inaugurates an irrevocable change in the student-centered class. In the act of handing back grades or evaluations, the female professor exposes herself as a impostor, a phallic mother who pretends to offer the almost pre-linguistic acceptance of the imaginary, but invokes the symbolic order to measure student "progress." Students' uncomplicated identification with the maternal has been destroyed; the female professor has substituted symbolic judgment for the visual, discursive affirmation (even mirroring) typical of classroom interactions, and the signifiers she has chosen usually inscribe lack. To students, this is a simple betrayal: since they view "mothers" by definition as nonjudgmental - fathers "discipline" errant children in their families - a woman who imposes discipline has betrayed her role. A mother would never be so stern, so "demanding and judgmental," as one student told me, continuing, "you could learn a few things from my mother about how to act."

Fisher students, having in the past been punished for challenging authority directly, typically express their rage at this betrayal passive-aggressively. The chaos that infiltrates the classroom in the following weeks takes a variety of forms and depends on individual personalities and group dynamics, which of course vary from class to class. But the rebellion always takes the following forms. Some students refuse to complete writing assignments; on many days, a majority of class members has not complete the readings; still others, often the majority of the class, refuse altogether to participate in class discussion and sit silently with expressions of resentment, watching the clock. A few students interrupt me, talk while I am talking, and/or attack my decisions and opinions with ridicule or open hostility. Significantly, their characteristic attempts to block the progress of the class are linguistic; all involve producing inappropriate or disruptive words or refusing to provide words at all. (As a metaphorical echo of toilet-training, the situation is almost laughable.)

The loss of the maternal imaginary is reflected in these little enactments of separation - students' ways of asserting their autonomy and repressing and reconstructing their pain into indirect and typically linguistic forms. Of course this facilitates their transition into the symbolic order. Rejecting the fluidity of their former identities, they work to establish themselves as "tough," "hard," "mean," and often aggressive. They sabotage both large- and small-group discussions, which they now freely disparage as "a waste of time" or "stupid," simply by refusing to speak. (It is interesting that my female students display little differentiation from male students in their actualization of the Lacanian paradigm. Ironically, the brightest of them typically embrace the phallogocentric model of academic achievement unquestioningly, and are often eager to dissociate themselves from what Belenky et al. have called "women's ways of knowing," which these female students regard as "wimpy" and inferior.)

These actions and non-actions have a disruptive effect on the classroom; all of them bring student participation to a grinding halt. My attempts to call attention to and analyze the difficulties only serve to clarify the *aporia* that has become the unspeakable subject of the course. Since in every course I am ostensibly teaching an academic subject like writing or postmodern exile narratives or Victorian poetry, at this juncture I usually face two options. The first is to preserve the student-centered structure of the course and proceed in spite of the students' refusal to participate. Sometimes I ask students to write; sometimes I come in and simply sit down at a desk in the back of the room and ask a student to take over; sometimes I ask opening questions, sit waiting for responses, and after a couple of minutes get out a book and read until someone decides to speak. Students' responses eventually become so attenuated that the class becomes, in the words of one colleague, like "mental dental work." I begin to dread showing up for class; I find myself watching the clock; I find it difficult to remain patient with the students and to respect them, since their passive-aggressive resistance, even when pointed out to them, persists until it is nearly tangible. On such days, I think of giving up teaching altogether.

But that's the point, isn't it? It is also, significantly, usually the turning point. Exhausted and frustrated, I give up trying to pull things out of them, and start talking more. (The rationalizations one can make for this are endless, but they begin with "I want to make it easier on myself" and "give them what they want" and usually end with "I have to cover a certain amount of material" - all of which are in practice antithetical to the aims of the student-centered classroom.) Talking devolves into lectures; with relief on their faces they get out their notebooks and start taking notes. The students start doing the reading; participation picks up though they still refuse to work together effectively in small groups. I swoop down on the ones who continue to behave disruptively, taking them aside and dressing them down, ordering them to behave more respectfully of me and others in the classroom, reading them the proverbial riot act. Instead of resenting this and making further challenges, to my eternal surprise, they seem to enjoy it, expect it. And why not? They have effected the desired metamorphosis; the phallic mother has publicly demonstrated her desire for the phallus by taking on the role of father - enforcer of rules, setter of standards, upholder of "rigor" (with all the phallic mastery that favorite academic adjective implies). The efficacy of the familiar banking paradigm - and, more important, of the symbolic order the banking paradigm manifests - has been reaffirmed because it has been restored. The students have repressed what they call the "touchy-feely" - the maternal. Their conviction that women lack authority has been confirmed, along with their confidence in their ability to control female behavior.

The personal cost of this classroom "drama" is substantial. My colleagues and I spend hours outside of class thinking about how to "make it work," blaming ourselves for the failure of our pedagogical strategies and trying to think up solutions to what we now simply call "the authority problem." We recognize that we are facilitating a psychological transformation that may have nothing to do with our courses' putative subjects; we know that students often learn much from interactions that seem horrendous at the time they happen. We recognize that we are caught up in a transitional cultural period in which these problems with authority and transference affect all women in authority to some degree. We know that these dramas are particularly virulent at our college because of the institutional environment, our students' psychosocial backgrounds, and our own relative lack of status as faculty members (we are all assistants or associates). Surely, we also contribute to the drama by supplying countertransference. I have expressed my own rage at my feminine position of exclusion by browbeating the most insolently patriarchal of my pupils. The "father" stage of the triangulation provides a certain relief for exhausted faculty members as well as for students.

Though these factors mitigate the apparent futility of the situation, none helps us solve the problem of how to run student-centered classrooms. How, as women and scholars, can we avoid the process of "denying, absorbing, and being absorbed" by an epistemological system that we know to be subtly co-optative and ultimately oppressive - for ourselves and for our students?

RECONSTRUCTION OF GENDERIZED REALITIES: PERCEPTION CHANGES OF REENTRY WOMEN AND THEIR SPOUSES DURING THE PROCESS OF HIGHER EDUCATION

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INTRODUCTION

Many married women are returning to school to pursue higher education, and as they matriculate through the process, they undergo changes that affect not only their own lives, but also the lives of their spouses. The marital relationship is an ongoing, often fragile, process that has many ups and downs throughout its lifetime, and as each spouse undergoes changes, it naturally has impact on the marriage. This study qualitatively examined the reconstruction of realities of fourteen reentry women and their spouses during the process of higher education.

METHODOLOGY

The methods that were used in this research were the grounded-theory investigation approach as developed by Glaser and Strauss (1967), blended with a phenomenlogical investigation of emerging themes. The goal of this study was synonymous with the goal of grounded theory, as it was to generate a theory that accounted for a pattern of behavior which was relevant and problematic for the population involved (Strauss, 1987, p.34).

Since I was actually living the very research that I was studying (since I was a married adult woman who returned to school myself), it seemed most appropriate and very natural to also do a constant comparison of my reality to these women. Therefore the phenomenlogical approach, in which there is a "consciousing of self" in relationship to the phenomena that emerge, blended well with the grounded theory approach (Stanage, 1987, p.47).

Semi-structured interviews were conducted with fourteen volunteer returning adult women students and their spouses. In order to get accurate individual perceptions, the interviews were conducted separately and consecutively.

The women varied in age from 27 to 53; whereas, the men ranged in age from 34 to 57. The average length of time that the women attended school at the time of the interview was 2.5 years. The study specified that the students were to be returning adult females who started at Sauk Valley Community College and were currently pursuing their educational goal. Several of these women had matriculated to a four-year university. Due to the fact that Sauk Valley Community College consists of primarily Caucasian students, this made variation in ethnicity difficult. One couple out of the fourteen offered diversity, as the wife was Hispanic and her husband was African American.

As the study unfolded, five major themes emerged with the first theme permeating throughout the rest: (1) reconstruction of reality; (2) self-esteem, voice, growth; (3) spousal status hierarchy; (4) relationship perceptions; and (5) husband support.

RECONSTRUCTION OF REALITY

In 1970, Peter L. Berger and Hansfried Kellner theorized that two individuals come together in marriage, each bringing with them a construction of their own reality, and together they construct a reality for themselves as a couple (in Coser, 1974). As a couple plays out their marriage, day in and day out, they validate this reality through their conversations with each other and through their contact with their society (See Figure 1).

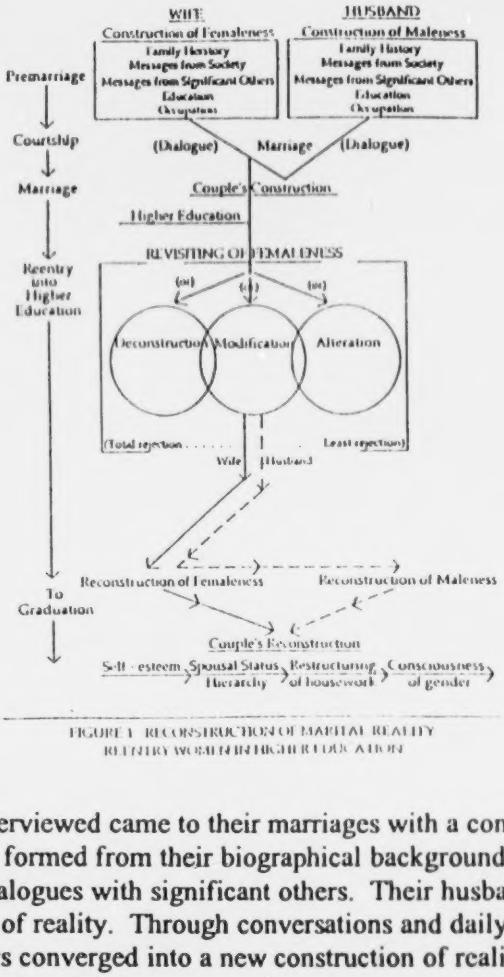
WIFE
Construction of Femaleness
Family History
Messages from Society
Messages from Significant Others
Education
Occupation
HUSBAND
Construction of Maleness
Family History
Messages from Society
Messages from Significant Others
Education
Occupation
Premarriage
Courtship
(Dialogue)
Marriage
(Dialogue)
Marriage
Couple's Construction
Higher Education
Reentry into Higher Education
REVISITING OF FEMALENESS
(or)
(or)
(or)
Deconstruction
Modification
Alteration
(Total rejection . . . . . .
. Least rejection)
Wife
Husband
Reconstruction of Femaleness
Reconstruction of Maleness
To Graduation
Couple's Reconstruction
Self - esteem
Spousal Status Hierarchy
Restructuring of housework
Consciousness of gender

FIGURE 1. RECONSTRUCTION OF MARITAL REALITY REENTRY WOMEN IN HIGHER EDUCATION

The women interviewed came to their marriages with a construction of their reality which had been formed from their biographical backgrounds, the society in which they lived, and their dialogues with significant others. Their husbands, too, came with their own construction of reality. Through conversations and daily interactions of marriage, the two views converged into a new construction of reality within the marriage. They each adopted a new modified persona within that marriage and constructed a reality of themselves as a couple.

As they retold the happenings of their past lives to each other, they told of events from their own perspective as they remembered them and added their individualized interpretations. In turn, the other spouse added his\her interpretation. Together these stories then became solidified as reality for both of them. An example of this can be seen in the construction of reality in couple number seven, Jill and Bob. Jill had been told negative things about herself from her family as she was growing up. She was told that she was not very bright, that as a female she was less important than her brothers, and

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that she was definitely not college material. When she married Bob, she passed to him her reality as she had come to accept it; he internalized it as truth.

Then something happened that gave Jill the courage to test that reality. She was influenced by a female role model who repeatedly told Jill that she had created an inaccurate picture of herself. When the role model left Jill a stipend directed towards higher education, Jill found the courage to test the situation by starting classes at the community college. Her positive experience led her to reconstruct a new reality.

The research revealed that through the process of higher education a woman revisits her construction of reality, both of herself and her marriage. (see Figure 1). The women underwent one of three possible phases during their time of revisiting: (1) deconstruction; (2) modification; or (3) alteration. The most dramatic phase, deconstruction, was depicted by an almost total rejection of "femaleness," as they had come to accept themselves. It was often accompanied by anger, since the women felt they had been cheated and lied to by significant others throughout their lives. Jill and three other women went through the deconstruction phase.

The second possible phase, though less drastic, but equally important, was modification. The eight women who underwent this phase accepted parts of their reality while rejecting other components of it. Limited changes took place, but they did not totally reject their "person" as they had come to know themselves. For example, a woman might have rejected certain "shoulds" that she associated with being a wife, but at the same time she still accepted the core construction of herself.

The third phase, alteration, was the least dramatic phase of the three. The dictionary meaning of alter is "to make different without changing into something else" (Merriam-Webster, 1993). This is exactly what happened to the two women in this phase as they accepted differences, but did not change their being.

Whichever phase a reentry woman underwent was determined by the correlation of original messages to those messages she was currently hearing from society (especially community college professors and students). The more negative the correlation, the more extreme the phase. In other words, the women who went through the most radical phase, deconstruction, had heard and accepted original negative messages about themselves as females that were far different from what they experienced in higher education.

It was during this revisiting of femaleness that women had the opportunity to invite their husbands to join them on their journey, and men in turn had the opportunity to accept or reject the invitation. The seven husbands who united in the process, primarily through their daily dialogue, came to understand the changes and growth occurring within their wives .

The husbands who did not share in their wives higher educational experience often were not only oblivious to the process, but also found the women's growth a source of contention in their relationship. They, for one reason or another, were not making this journey with their wives and were maintaining their old construction of realities. Therefore, there were discrepancies between these husbands and their wives--often in how they viewed themselves, how they saw their spouse, and in how they defined their realities as couples.

The couples who did reconstruct similar realities spoke of harmony and did not perceive an imbalance in their relationship. Instead, their reconstruction moved across a continuum with each step presenting a higher level of satisfaction in the marriage. The major reference points were: (1) self-esteem; (2) spousal status hierarchy; (3) restructuring of housework; and (4) consciousness of gender.

SELF-ESTEEM

The women's esteem level at the beginning of their educational experience correlated with findings of studies reviewed from the literature; 12 out of the 14 women had low self-esteem problems initially. All but two of the women indicated that they thought they were dumb or directly stated that they knew they had a low self-esteem.

All of the women had their self-esteem raised through the process of higher education, and often spoke of how they felt smarter, had more confidence in themselves, and discovered their voice. The theme of voice is also not new and, in fact, is a major thread throughout Belenky, Clinchy, Goldberger, and Tarule (1986) *Women's Ways of Knowing*. As was true in their study, "women repeatedly used the metaphor of voice to depict their intellectual and ethical development; and that the development of a sense of voice, mind, and self were intricately intertwined" (Belenky et al., 1986, p. 18).

SPOUSAL STATUS HIERARCHY

The second reference point on the continuum of reconstruction was spousal status hierarchy. Berger and Kellner (in Coser, 1974) theorized that the husband and wife construct their world within marriage through their conversations and must come to some agreement of their reality or their relationship is endangered (p. 166). This study found that positions of status within the marriage were part of that constructed reality.

In seven of the 14 couples interviewed, the husbands and wives agreed upon a lower status for the wives prior to their education, and all seven projected that it would be equal after her education. The projection of higher status for the wife was based on their sense of her rising to a higher position during her educational experience.

The other 7 couples had a great deal of variance in their spousal status hierarchy, but the following are observations from the total group:

1) Ten couples agreed upon the wife's status prior to the beginning of her education;
2) Eight couples agreed at the end;
3) Ten females constructed upward movement in their own status;
4) Twelve females constructed that they now had equal or higher status, only three perceived they had equal or higher status in the beginning;
5) Nine males constructed upward movement of their wives' status and
6) Twelve males constructed that their wives' now had equal status or would at the conclusion of their education; only three perceived equal status for their wives in the beginning.

RESTRUCTURING OF HOUSEWORK

Division of labor, boundaries, negotiations, and dominance (Gerson & Peiss, 1985) all become issues that accompany the process of education of the married reentry woman. Perhaps it is first best to step back and assess why it is so important to research a topic that appears as menial as housework. The actual work that is done in the home is not nearly as important as the *symbolic* meaning that it encompasses. When housework is "genderized" as female, it carries with it a symbolic meaning of subordination that is often resisted or embraced for that very reason (Berk, 1985; DeVault, 1990; Hochschild, 1989).

Since I suspected that the interviewees might be aware that a positive indication of behavioral support would be the politically correct answer, I had lengthy discussions on the topic to make certain that an accurate picture of the support was being given. When at all possible, two ratios were supplied by each of the spouses: one indicating the amount of household work done by the wife in comparison to her husband prior to college, and another now that she was in college. When the spouses' ratios matched, then I concluded that their perceptions of division of labor were close.

Nine out of the 14 women (64 percent) were receiving behavioral support in terms of a redistribution of household chores or parenting. Naturally, there were differences within these nine couples as to the amount of household work that the men were now doing because of the variances in their original load. Some of the husbands had been doing very little, whereas others had been sharing the load almost equally before the wife started school. There was, however, a complete interchange of distribution with four of the couples. These wives went from carrying the bulk of the household load to relinquishing the majority of the responsibility to their husbands.

CONSCIOUSNESS OF GENDER

The final phase of the reconstruction continuum is a consciousness of gender. Linda Thompson states that "gender is something evoked, created, and sustained day by day through interaction among family members (1992, p. 7). All of the couples in the study were genderized. By that I mean, all had accepted the fact that the home was the wives' domain and the husbands were primarily in charge of bringing home the wages. As the couples began to cross physical boundaries of housework and\or parenting that were once genderized for the wives only, and as the wives status began to move upward, an awareness of gender issues began to take place.

The husbands were "helping out" in the home as an expression of their love and support to their wives; but as the process continued there began for some of them to be a consciousness of how they had genderized their roles. For the present time they were reconstructing their reality to include new roles within their marriage. What this study is not able to answer is how the couples will react once the wife has finished school, joined the employment force, and is bringing in an income.

On the other hand, the very fact that seven of the couples were able to reconstruct a reality for their marriages that now included a higher status for the wives and a shared work load in the home could act as a spring board to an egalitarian system. The direction to which the family unit will gravitate depends largely on the consciousness level of the spouses.

For a lasting reconstruction of reality to occur that includes gender consciousness, the process must a united journey of both the reentry woman and her spouse. If it is not united, then the transformation\consciousness of the wife becomes a central point of conflict resulting in a power struggle rather a sense of understanding and togetherness that can only occur in marriage of equality. However, when a full reconstruction of marriage occurs during the process of higher education, it can lead to a richer relationship in which both partners join in the growth.

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Nontraditional Recruitment and Vocational Education: Implications for Postsecondary Institutions

by

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The 1991 the A. A. U. W. study "**Shortchanging Girls, Shortchanging America**" indicated that many young women of junior high and high school age suffer from low self esteem at critical stages of their education. This lack of self-esteem is one reason why young women complete their high school education without taking advanced classes in math, science, computers, or technology and why so many gifted young women do not pursue postsecondary studies in these areas. An analogous situation exists in vocational education. While young women account for approximately half of all high school vocational students, the majority of them enroll in traditionally female courses such as home economics, office education, and cosmetology. Less than twenty percent enroll in nontraditional areas like agriculture, drafting, electronics, or machine shop. Even more alarming is that fact that the overwhelming majority of high school women who enroll in and complete nontraditional courses of study (those who would seem likely to have the confidence and persistence to succeed) choose not to continue in a nontraditional course of study at the postsecondary level. In the last year of their high school education, vocational students are often uncertain about whether they should continue their education, where they might continue such an education, and how to find out about financial assistance. Those students who are most likely to need assistance and encouragement - handicapped, disadvantaged, minority, and female students - appear to be those least likely to receive the support and encouragement they need.

While few programs on the secondary or postsecondary level provide recognition for successful nontraditional students, there are even fewer such programs for vocational students. As a state-wide gender equity program funded by the Tennessee Department of Education, Tennessee Opportunities initiated a state-wide nontraditional student scholarship contest in the spring of 1989 at the request of the state sex equity coordinator. The contest was designed to recognize outstanding high school vocational students who were enrolled in classes that were nontraditional for members of their sex and to provide limited financial assistance to those students as a means of encouraging them to continue on to the postsecondary level. Our experience over the last seven years indicates that universities, community colleges, and adult vocational institutions could stimulate the entry of young women into nontraditional areas through the creation of cost-effective award programs that provide recognition and financial assistance to high school age women enroll in nontraditional vocational courses while in high school.

According to the enrollment statistics kept by the Tennessee Department of Education, sixty-five percent of the young women who enrolled in vocational education in 1982 chose home economics, office education, occupational home economics, or cosmetology. In 1990-91, fifty-one percent of the women enrolling in vocational classes chose those same courses. And what about nontraditional vocational enrollment? In 1981-82, seventeen percent of the young women chose to enroll in nontraditional courses such as agriculture, industrial arts, trade and industrial classes (other than cosmetology), or marketing which is about evenly divided between the sexes. In 1990-91, that number had only risen to 18 percent. When a substantial decline of enrollment over the previous decade is taken into account, the only nontraditional vocational area that has seen an actual increase in the number of female high school students during the past decade is agriculture which has seen a total increase of 400 female students.

In postsecondary education, the situation is much the same. According to **The 1991-92 Tennessee Board of Regents' System Summary on the State of Women in Academe**, "Women make up 56% of all students at TBR governed institutions. Women make up 53.8% of all undergraduates and 58.2% of graduate students at the university level and 58.5% of students at two year institutions." However, the report points out that *"Women in TBR institutions continue to select fields traditionally associated with women - nursing, allied health, education, and the liberal arts."* The report also points out that in areas like business, women may make up the majority of graduates, but the numbers mask the fact that many of these women complete business technology programs like secretarial science and office systems technology that prepare them for low paying, traditionally female jobs. The regents' summary concludes that no substantial changes in enrollment patterns have occurred on the postsecondary level during the last decade and a half. According to **Women in the Workplace**, a report issued by the Tennessee Department of Employment Security in 1986, almost 60% of the college-trained professional women in Tennessee were employed as non-college teachers or registered nurses. Only 18.2% of female college graduates in Tennessee earned over $15,000 per year compared with 63% of the male college graduates.

For the past six years, Tennessee Opportunities has awarded $8,000 in small scholarships of $250, $150, and $100 to fifty-eight high school vocational students (44 female - 14 male) who were interested in pursuing courses in nontraditional areas such as agriculture, auto mechanics, drafting, engineering, and welding for young women; and nursing, food services, and office education for young men. A follow-up study of scholarship winners conducted in March of 1995 found that over seventy percent of the female winners continued to pursue nontraditional training after their first year of postsecondary education. Sixteen female winners have completed degrees, ten in such nontraditional areas as animal science (5), engineering (2), and industrial technology (3). Five young women have completed certificates in nontraditional programs such as drafting, electronics, and welding. Of the twenty female students who are still in school, fourteen, or seventy percent, are enrolled in nontraditional areas. While the numbers for male winners are not as impressive, the figures are still significant. Fifty seven percent of the male students have continued to pursue nontraditional courses of study. Five have earned either degrees or certificates, three in nontraditional areas. Of those young men who are still enrolled, fifty percent continue in nontraditional areas.

Beginning in 1993, a category for students enrolled in nontraditional programs of study at universities, community colleges, and technology centers was added. Out of twenty-two scholarships awarded (7 male and 15 female), all but one student have completed their program of study or are still enrolled in a nontraditional area. Seventeen students have earned degrees or certificates. Four women have completed four year degree programs in aerospace management, animal science, industrial technology, and chemical engineering, and four have earned associate degrees in automotive technology, drafting, pre-engineering, and industrial technology. Five women have also earned certificates in plumbing, drafting, and welding. One male student completed a bachelor's degree in elementary education, two completed associate degrees in nursing and secretarial science, and one earned a certificate as a licensed practical nurse.

It was our intention from the very first to make the application process as uncomplicated as possible to encourage as many students to enter as possible and to provide awards to as many students as it was financially feasible . The annual nontraditional student scholarship contest is announced in the winter issue of the *Tennessee Opportunities* newsletter which is distributed to all public high schools and postsecondary institutions in the state. The nomination process only requires a photograph and a personal letter that includes the following information: what school the student is attending, the program the student is enrolled in, plans for after graduation, information about club and organization activities, and the name and phone number of a teacher or advisor that we can contact. Nominations can be made by teachers, counselors, or family members, and students are also encouraged to nominate themselves. High school students must have been earned at least two credits in a nontraditional area. Postsecondary students must be currently enrolled and have a declared major in a nontraditional degree or certificate program. All nominations must be postmarked by March 15th in order that we can inform the students of the results by the beginning of April. The early summer issue of the *Tennessee Opportunities* newsletter features the contest results and includes photographs of the first and second place winners in both categories. On average, nine to ten high school students and a similar number of postsecondary students are selected to receive scholarships. Students who have been active in vocational clubs such as the Future Farmers of America and the Vocational Industrial Clubs of America, who have a clear statement of their career intentions, or strong support from their teacher/advisors generally receive priority. First place winners receive scholarships of $250, second place $150, and third $100. The project staff make a special high-quality certificate for each high school winner and arrangements are made with the local school to present the award to the student during senior class night or another appropriate ceremonial occasion. When possible, the first place winners of both the high school and the postsecondary categories are invited to attend an awards luncheon in Nashville.

As part of the follow-up study conducted in March of 1995, surveys were sent to approximately 150 students winners and their teachers and advisors. Almost two-thirds of the surveys were returned. Seventy-nine percent of the teacher/advisors and forty-three percent of the students responded. Both teachers and students were asked to rate the usefulness of the scholarship money and the significance of the award on a five point scale from very useful to not useful at all. Teacher and student responses were virtually identical and extremely positive. As a group, teachers rated the usefulness of the scholarship money at 4.71 while students rated it at 4.72. The significance of the award received even higher scores with both teachers and students rating it at 4.82. When asked whether the scholarship program should be continued ninety-five out of ninety-six respondents said yes.

There were also numerous anecdotal comments about what the award had meant to the winners:

> *"Thanks ! The money helped pay for books. The help was really appreciated.*
>
> *"I felt very honored. Knowing that I actually won such an award helped to increase my self confidence."*
>
> *"The award was very significant to me, both emotionally and financially."*
>
> *"As a husband and father of three the award could not have been more appreciated."*
>
> *"I was honored to receive an award. It made me feel proud to be a nontraditional student."*
>
> *"Without the scholarship money, my former student couldn't have paid the tuition at the local adult vocational center. She's now a welder!"*

Researchers and gender equity specialists have focused their attention and efforts on improving teacher and counselor education, publicizing opportunities for nontraditional training, providing K-12 students with nonbiased career education, and the creation of counseling workshops to recruit potential students. These efforts are important and have begun to lay the groundwork for the educational reform that is necessary. However, such broad and comprehensive approaches sometimes overlook immediate and effective strategies.

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The Nontraditional Student Scholarship Contest has generated interest among high school vocational students and their teachers, especially young women in agriculture and drafting. Success rates for contest winners have been high. More than two thirds of the high school scholarship winners (73% of the female students and 57% of the male students) continued to pursue nontraditional training on the postsecondary level. A category of scholarships for postsecondary nontraditional students added in 1993 has generated similar results. Our experience over the past seven years indicates that by providing recognition and limited financial assistance to students who have enrolled in nontraditional vocational courses on the high school levels, universities, community colleges, and adult vocational schools could increase the number of successful nontraditional students, especially in agriculture, engineering, engineering technology, drafting, and nursing. In addition, nontraditional high school students in agriculture and drafting would seem to have a range of experiences and interests that should prepare them for a variety of postsecondary programs.

Conclusion

Female students constitute the majority of students in Tennessee on all levels. Females make up the majority of elementary, middle school, and high school students. Female high school students are much more likely to earn a diploma than their male counterparts, and female college students make up the majority of graduates from both two year and four year public institutions. Yet, female students continue to enroll in traditionally female classes on the high school level and in traditional degree and certificate programs at postsecondary institutions.

Discrete forms of bias are a direct cause of low female enrollment in almost any high school course; other than home economics, office education, cosmetology, and marketing; that is not required to graduate. An attitude of complacency exists because of the belief that once overt bias has been removed from enrollment procedures, textbooks, and classroom materials that equal opportunity exists. Words, images, and attitudes still can contain elements of prejudice that limit personal and national achievement in ways that are as damaging as any form of overt discrimination. While overt discrimination and bias against women may no longer be as significant a problem as they once were, discrete forms of sexual bias contribute directly to low female enrollment in courses that are traditionally male, the low rate of success that many females who do enroll in nontraditional coursework on the secondary level experience in trying to find employment in the field for which they have trained, and the concentration of females who have taken vocational education courses in low paying manufacturing or service jobs upon completion of their education.

Discrimination and bias have many faces, but perhaps the most deeply held prejudices are hidden within words, images, and attitudes, that limit human potential, not by overt action, but by innuendo, inference, and omission. There is a strong perception among many educators and parents that the college preparatory track is the only path to college and that vocational education, leads to dead-end jobs. The results of the

Nontraditional Student Contest over the past seven years indicates to us that attitudes about vocational education sometimes limit the opportunities that are available to young women. In order to overcome years of discrimination and socialization, affirmative programs that challenge sex-typing stereotypes are necessary, but to truly succeed those programs must also challenge stereotypes about vocational education.

Contrast and Convergence:
Career Paths and Responsibilities of Graduate Deans[1]

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This paper explores contrast and convergence in the career paths and responsibilities of graduate deans in colleges and universities across the country. Unlike previous studies which have discussed deans' career paths irrespective of gender, graduate deans' gendered perceptions of their roles, or included academic deans among other administrators in analyzing career paths,[2] this study considers not only gender but age and longevity as a graduate dean in investigating commonalities and differences in graduate deans' perceptions and experiences in higher education.

In September 1994, graduate deans at 250 institutions affiliated with the Council of Graduate Schools received a questionnaire inquiring about their personal backgrounds, professional career paths, current positions, and off-campus professional and non-professional activities. In addition to demographic information about sex, birth year, race, marital history and status, the open ended questions covered such personal background topics as birth order among siblings, children's ages, current household composition, growing up community, and secondary schooling. In inquiring about professional career paths, respondents were asked not only about undergraduate and graduate institutions, fields of study, degree years and professional positions, but about their perceptions of career choice influencers, career assisters, career obstacles and interruptions, career satisfaction and accomplishments, and anticipated career changes. Graduate deans were asked about their current positions, including length of service, reporting structures, and relationships with supervisors, programmatic responsibilities, leadership styles, and satisfactions and frustrations with their deanships. Deans were asked about their involvement with professional associations, recent presentations and publications, and receipt of professional awards. Finally, respondents were asked about their principal non-professional activities and their assessment of the balance between professional and non-professional activities in their lives.

The 113 (45%) graduate deans responding to the questionnaire include 82 (73%) men and 31 (27%) women.[3] Almost all are EuroAmericans (95%M/90%W), while the remainder are African Americans. The graduate deans fall into three major age cohorts: those born before 1934, between 1935 and 1994, and 1945 and after.[4] For purposes of this analysis, graduate deans who have served as deans for three years or less are considered "junior" and those who have served for four years or more are "senior". Men and women graduate deans do not differ significantly in age, though proportionately more women than men are in their sixties (18%M/32%W). Nevertheless, men have held the position of graduate dean longer than women deans.[5]

Analysis of graduate deans' responses illuminate two major areas of convergence and four significant contrasts in the professional experience of women and men graduate deans. The convergences pertain to role responsibilities and professionalism; the contrasts relate to career path realities and perceptions.

The programmatic scope and responsibilities of graduate dean vary between institutions. In certain colleges and universities the graduate deanship is a comprehensive role with responsibility for program and policy development and implementation, graduate admissions and advising, financial aid and record keeping as well as fund raising (35%); in others, the role is limited to admissions and program implementation (21%) or to admissions and advising (7%). The graduate dean's gender is not significantly related to the dean's areas of responsibility, the level of graduate program (master's and/or doctoral), the size of the student body, or the number of staff reporting to the dean. Moreover, most graduate deans report to the chief academic officer (78%M/81%W), some to the vice president for research and graduate education (4%M/7%W), some report to both the president and the chief academic officer (5%M/13%W), and some men who hold research titles report directly to the president (10%). These decanal role characteristics pertain to institutional differences rather than to gender differences.

Another major convergence among graduate deans is in their professional commitment. This commitment is expressed not only in their role satisfaction as deans in assisting the careers of faculty and students (30%M/26%W) but in their personal professional activities. Most graduate deans are active in national and regional professional associations (89%M/90%W). Senior deans are active in both higher educational and disciplinary organizations or higher educational associations, whereas junior deans tend to be more active in disciplinary associations. Within the past five years, most deans have given presentations at meetings of national and regional professional organizations (76%M/81%W). Moreover, the proportion of junior deans giving presentations is greater than that of senior deans (M:0-3 59%, 4+ 53%/W:0-3 70%, 4+ 50%). While most graduate deans have also published books, chapters, and articles within the past five years (58%M/70%W), more women than men have published. Although senior men out publish junior men (M:0-3 73%, 4+ 81%), junior women out publish senior women (W:0-3 78%, 4+ 43%). Nevertheless, scholarship is the career accomplishment that all deans most frequently cite (33%M/26%W). Thus, the personal professional activities of all graduate deans convey their professional commitment to their disciplines and to higher education.

Although there are convergences in role responsibilities and professionalism among graduate deans, significant career path contrasts exist between men and women deans. This paper discusses four salient ones: the delayed career pattern, the unsupported career pattern, the confident career pattern, and the relational career pattern. These four contrasting constructs illuminate the most salient gendered differences in career paths disclosed by graduate dean respondents.

Characteristic of women graduate deans, the delayed career pattern is indicated by age at doctorate, length of decanal service, and career expectation. With one exception all the graduate deans hold doctorates, primarily in Arts and Science fields but also in Health Sciences and Education.[6] Women, however, received their doctorates later than men in the same age cohort. Thus, while in the oldest cohort, 57% men received their doctorates during the 1960s, 70% women received theirs in the 1970s; in the cohort born between 1935-44, 66% men received their doctorates in the 1960s and 62% women in the 1970s; and in the youngest cohort, 79% men received their doctorates in the 1970s and 50% women in the 1980s. Thus, women typically receive their doctorates a decade later than men in the same age cohort.

Gender difference in length of service as graduate deans also indicate the delayed career pattern. Although for all deans length of decanal service is correlated with age in such a way that older cohorts have been deans longer, proportionately fewer women have served for as long a period of time as men. Thus, for graduate deans in their 60s, 66% men but 50% women have served as graduate deans for four years or more, for deans in their 50s 56% men and 13% women are senior deans, and for those in their 40s 42% men but 0% women are senior deans. Conversely, 50% of women in their 60s but only 33% men have served three years or less; 100% women in their 40s but 58% men are junior deans. That most women deans have served as graduate deans for three years or less and most men have served for four years or more reflects the delayed career pattern characteristic of women deans.

Another indicator of the delayed career pattern is gendered career expectation differences among graduate deans. While 42% men and 36% women do not plan any additional career changes other than retirement, 48% women but only 25% men aspire to promotion to vice president or president. While most of these women (57%) are junior deans, they include women in all age cohorts (W in 60s 20%, 50s 62%, 40s 63%). Only in their 40s do a majority of men anticipate climbing further up the academic administrative ladder (M in 60s 13%, 50s 19%, 40s 53%). The continuing professional ambition of older women is a positive consequence of the delayed career pattern.

The second salient gendered career contrast is the unsupported career pattern. Indicators of this pattern include differences in career choice influencers and assisters, career paths, and relationships with supervisors. Suggestive differences exist among women and men in their perceptions of who influenced their career choices and who assisted their careers. Not only do more women than men say that "no one" influenced their career choices (3%M/10%W) but more men than women cite their parents as career choice influences (16%M/10%W) suggesting that early in their lives men enjoy more career support than women. Moreover, although a college/university mentor is important for men and women, such a mentor is more frequently cited by men than women (38%M/23%W). Men's parental support, however, is balanced by women's spousal career support (16%). Nevertheless, these differences reinforce notions of the strength of early parental career support for men and the delayed career pattern of women.

Women and men also differ in their perceptions of who assisted their careers. While women and men note the same categories of career assisters, they differ in their evaluation of that assistance. While 35% men identify a disciplinary mentor, only 19% women do; while 48% women identify a senior administrator, only 30% men do; while 19% women identify their spouses, only 7% men do. However, younger men and women more frequently cite their spouses as career assisters than older deans; older women more frequently perceive administrators as assisters than younger women, and older men more frequently cite disciplinary mentors. These differences in perceptions of career assisters suggest that women's careers are less supported by disciplinary mentors and that administrators rather than disciplinary colleagues recognize women's potential administrative abilities.

Supporting this inference are gendered differences in career paths. Women and men follow several paths to the graduate deanship. One leads from faculty ranks directly to the deanship, another from faculty ranks through an administrative position to the deanship, a third from faculty ranks through another deanship to the graduate deanship, another from faculty status through positions outside academe to the graduate deanship, a fifth from an administrative position outside academe to the deanship, and a sixth from an administrative position to the academic deanship.[7] Despite the variant paths to the deanship, the two most often pursued are either from faculty ranks to the graduate deanship or from faculty ranks through an administrative position to the graduate deanship. Women and men, however, differ significantly in the career path that they most frequently follow. While 52% women deans entered the graduate deanship without prior administrative experience, 47% men had such administrative experience. Moreover, prior administrative experience is increasingly true of younger cohorts of men and of men more recently appointed to graduate deanships but not of women. These findings indicate that men are better prepared for the administrative responsibilities of the deanship and that women's careers are less well supported.

Another indicator of the unsupported career pattern relates to relationships with supervisors. Despite similarities in reporting structures for all deans, men say that they interact more frequently with their supervisors than women do. While 20% men say that they interact daily with the person to whom they report, 13% women make this claim. While most graduate deans interact with their supervisors at least weekly (73%M/79%W), slightly more women than men interact infrequently with them (5%M/7%W). Just as women deans interact less frequently with supervisors, fewer women characterize their relationship with their supervisor as very positive (74%M/50%W) and more women characterize this relationship as poor (5%M/13%W). These gendered differences in interaction and quality of relationship with their supervisors have implications not only for deans' current job performance and satisfaction but for future professional advancement.

Another salient gendered career contrast among graduate deans is the confident career pattern. Among its indicators are perceptions of career assisters and career obstacles, as well as career and position satisfaction. This career pattern is more characteristic of men than women. While 27% men state that no one assisted their careers, only 10% of women make this claim; while 55% men report that they did not encounter any career obstacles, only 21% women share this view; while 35% men perceive that a disciplinary mentor assisted their careers, 19% women hold this view. Although all graduate deans express satisfaction with their careers, a slightly higher proportion of men (76%) say that they are very satisfied with their careers (71%W). The greater satisfaction of men with their roles is further indicated by the larger proportion of men who say that even if they could, they would not make any major change in their deanship (24%M/15%W). Moreover, women and men differ on what they would change about their deanship. Consistent with the confident career pattern, men cite increasing areas of responsibility (27%), increasing budgets (15%) and making staff changes (10%), while women would make staff changes (22%), increase areas of responsibility (15%), change reporting structure (11%), and change office structure (11%).

Another major gendered career contrast is the relational pattern characterizing women deans. Indicators of this pattern include perceptions of career obstacles, balance between professional and non-professional activities, and satisfactions in the deanship. Domestic responsibilities are perceived as career obstacles by 36% women and only 4% men; more older than younger women cite domestic responsibilities as career obstacles, though more younger women currently have familial obligations.[8] Although most deans consider that they have a satisfactory balance between their professional and non-professional lives, men are more satisfied with this balance than women (76%M/67%W). Irrespective of their household structure, more women than men consider family a principal non-professional involvement (13%M/23%W). Moreover, 19% women, especially younger women, claim insufficient time for personal life as a career frustration in contrast to 3% men. The relational orientation of many women deans is further expressed in their professed satisfactions with their current positions. For women, the most satisfying aspects of their roles were interactions with colleagues and students (26%), being able to make positive changes (23%), variety of tasks (19%), and successful problem solving (13%), whereas men noted interactions with colleagues and students (30%), program innovation (21%), institutional leadership role (10%), and variety of tasks (10%). While both women and men deans appreciate interactions with colleagues and students and their varied tasks, women also emphasize relational aspects of their roles, while men stress instrumental ones.

The principal conclusions of this exploration of convergence and contrast in graduate deans' career paths and responsibilities are that institutional characteristics explain differences in graduate deans' role responsibilities, that commitment to professionalism characterizes all graduate deans, but that certain career differences are related to gender or to gender, age and/or length of service. The most salient gendered contrasts are the delayed career pattern of women deans, the unsupported career pattern of women deans, the confident career pattern of men deans, and the relational career pattern of women deans. While these career contrasts are not empirically mutually exclusive, as analytical constructs they assist in illuminating significant differences in the professional experience of women and men graduate deans in American higher education today.

Endnotes

1. In preparing this paper, I am indebted to several Salem State College colleagues. I especially thank Diane Lapkin for contributing to the questionnaire design, Michael O'Brien for running computer data analyses, Pamela Shaw-George for brainstorming data interpretations, and Mary Jane Anderson and Suzanne Hennessey for helping to prepare the final text.

2. Joyce V. Lawrence, "Graduate Deans' Perceptions of Their Roles: Gender Differences Minimal," (1983 ms published in The Communicator); Kathryn M. Moore, Ann M. Salimbene, Joyce D. Marlier, and Stephen M. Bragg, "The Structure of Presidents' and Deans' Careers," Journal of Higher Education 54 (1983): 500-515; Rebecca Warner and Lois B. DeFleur, "Career Paths of Women in Higher Education Administration," in Patricia Turner Mitchell, Cracking the Wall (Washington: The College and University Personnel Association, 1993), pp.2-18.

3. Although 120 (48%) deans responded to the survey, only 113 filled out questionnaires sufficiently for analysis. In this paper, M = men and W = women.

4. Born: -1934:M15/W10; 1935-44:M48/W13; 1945-:M:19/W:8.

5. Longevity as Dean: 0-3years: M37/W23; 4years-: M45/W8.

6. Fields of Doctorates: Arts/Humanities:M16/W5; Social Sciences: M20/W8; Physical Sciences: M32/W8; Health Sciences M3/W3; Education: M10/W6; Unknown: M1; No doctorate: W1.

7. Path 1: faculty ranks>graduate deanship 34%M/52%W; Path 2: faculty ranks>administrative position>graduate deanship 46%M/29%W; Path 3: faculty ranks>deanship>graduate deanship 10%M/6%W; Path 4: faculty ranks>graduate deanship>graduate deanship+research title 2.5%M/0W; Path 5: faculty ranks>administrative position outside academe> graduate deanship 2.5%M/10%W; Path 6: administrative position>graduate deanship 5%M/3%W.

8. Household Co-residents by Age: None: -1934 7%M/10%W, 1935-44 2%M/15%W, 1945- 11%M/12.5%W; Spouse: -1934 80%M/70%W; 1935-44 67%M/54%W; 1945- 26%M/25%W; Spouse & Children: -1934 13%M/0W; 1935-44 31%M/15%W; 1945- 63%M/62.5%W; Relative: -1934 0M/10%W, 1935-44 0M/15%W, 1945- 0M/0W; Roommate: -1934 0M/10%W. With respect to marital histories, certain career pertinent differences are evident. All men have been married; some women (4%) have never married. A higher proportion of women are currently single (2%M/10%W) or divorced (1%M/13%W). Women married for the first time at a younger age than men (-20yrs. 7%M/17%W; 20-24yrs 61%M/67%W), but more women than men are childless (4%M/19%W) and women have fewer children (3-4 children: 44%M/22%W). Moreover, men's children span a wider age range, for women's children are older than men's in the same age cohort.

TEACHING FOR GENDER DIFFERENCES IN ELEMENTARY SCIENCE

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"Will we ever be able to eliminate all kinds of bias in schools?" This question, from one of the participants in this study, is a very important one. The fact that the sentiment is used by many teachers to perpetuate traditionally biased lessons and interactions is the concern which is being addressed in this paper. Some teachers indicated that since they can't eliminate all of the bias, and they are doing OK even though they grew up in a biased world, there is no need for change in the classroom.

Many teacher behaviors and teaching strategies have been identified that contribute to male-female differences in attitude and achievement in science classrooms. Social messages tell girls that science is a nontraditional arena. Both boys and girls define science as "male" as early as second grade (Klein, 1989). Research has focused on teachers' interactions with boys and girls in the classroom that may affect student achievement, attitudes, and performance (Sadker, 1984). Hendrick and Strange (1989) found that teachers did not favor either sex at the conscious level, but at the unconscious level, teachers were not aware of the subtle differences of gender bias in their language.

This study focused on teachers' beliefs of classroom interactions, grouping of students, materials, topics, activities, and teaching strategies used in science classrooms and assessing curricula and instructional interactions and methods to promote equity in the classroom.

The Study

Subjects

The sample for the study consisted of 116 teachers of kindergarten through grade six participating in the Developmental Approaches in Science and Health(DASH)[1] Summer 1994 Institute. The study and gender equity awareness sessions were conducted during the Pittsburgh, Pennsylvania DASH Institute. The participants represented a wide spectrum of communities: urban, suburban, and rural. Both public and private school teachers that selected for additional training in elementary science. The sample included 107 Caucasians, 7 African-Americans, 1 Native American, and 1 Asian/Indian. There were 105 female teachers and 11 male teachers, and the average years teaching experience was 13.14.

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[1] DASH was developed by the Curriculum Research and Development Group at the University of Hawaii. The hands-on program is only available to teachers who attend an intensive 10-day teacher institute.

Instruments

Each participant was asked to complete the survey, "Preparing Teachers to Analyze and Alleviate Sex Bias in the Classroom, the School, and the Community."[2] The survey presented a variety of classroom scenarios. Teachers were asked whether or not sex bias existed and to rewrite the scenario to eliminate the bias.

Approximately 13% of the females who attended the science institute failed to complete the survey which was distributed. Of the males in the summer institute population, 54.5% failed to complete the survey.

In addition to survey responses, each of the 116 teachers attending the DASH Institute participated in an individual interview.

A discussion session was held with all teachers during grade level group meetings. During the same meeting, each grade level group completed concept maps related to Equity and the following topics: Materials, Classroom Interactions and Grouping. The concept maps and discussion comments were used to support the findings of the survey.

Findings

Eleven of the 15 scenarios were intentionally gender biased. Only one of these scenarios was recognized by all of the respondents as being biased. On five of the remaining scenarios, more than 20% of the group failed to recognize bias in the situation.

The most commonly overlooked gender biased scenarios are outlined below. It should be noted that in many cases the respondents who stated that there was bias in the given scenario did not necessarily explain the reason in terms of gender bias.

Results are grouped by area: Classroom Interactions, Grouping by Sex for Competitive Activities, Women's Role in Books and History, and Role

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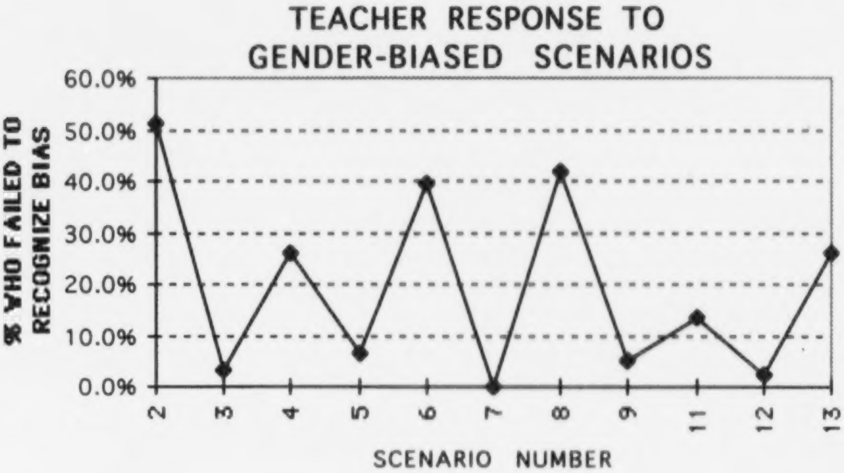
[2] Survey prepared for the Title IX Equity Workshops Project of the Council of Chief State School Officers by the Resource Center on Sex Roles in Education, National Foundation for the Improvement of Education.

Models. Information from the surveys, interviews and concept maps have been used to support the findings of the study.



Communication / Classroom Interactions

Scenario from Survey:
Teacher comments made during a 5th grade social studies lesson:
"Excellent work, Jim. You've really got a good grasp of the causes of the Civil War."
"Pete and Al, cut out the horsing around, and get going on your reading assignment."
"Wanda, I want you to know how pleased I am with the polite and well-mannered way you're behaving today."
"That does it, Pete. It's after school for you."
"Alex, the paper you handed in last week was excellent." You should be very proud."

Fifty-two percent of the teachers in the study stated that there was no gender bias in this situation. Of those that said that the situation was biased, only one stated that the number of females who are addressed should be equal to the number of males and that the type of interaction was not equal. Most stated that the situation would be equal if the teacher mentioned Wanda's work and not her behavior while ignoring the fact that the ratio of comments made was 4 to 1 in favor of boys.

The concept maps created about Classroom Interactions and Equity failed to produce statements related to gender and the type of communication between teachers and students in an elementary science classroom.

Grouping by Sex for Competitive Lessons

Scenario from Survey

"Spelling bee time! Boys to the right, girls line up by the windows. This will be an exciting contest."

Sex bias was not recognized by 42% of the respondents. None of the survey responses included information about the competitive atmosphere being more beneficial to male learning styles. Most of the people who agreed that there was a bias suggested an alternative method of grouping the students to carry on the same competitive lesson. Many teachers state that they were aware that the response should be, "Yes, there is sex bias," but defended the use of boy-girl grouping and this lesson, because, "The children really enjoy this type of competition," or "Competition between the sexes can be motivational."

Only one of the concept maps created by each of the grade level groups stated, "not by gender," under the discussion of grouping. Each of the other groups stated that boy-girl grouping and competition is encouraged in their classrooms.

The science program in which the teachers were being trained during this study makes use of cooperative groups for many activities. The teachers believed that the competition between boys and girls would be healthy and enjoyable in the hands-on classroom.

Woman's Role in Books and History

Scenario from Survey

"So far this semester, we have reviewed the life of the cavemen, man's discovery of fire and his development of primitive tools."

The inclusion of men and women in the term "caveman" was taken for granted by 40% of the teachers. Many who recognized a bias changed the words to "cave people" and "the discovery..." but stated that it really wasn't necessary. As one survey stated, "This is fine-tuned nit-picking.... I have no problem with women not being mentioned in "cave" days. I am sure they were on the scene pulling their weight."

During the discussion before the concept mapping activity, the majority of the participants were reluctant to believe that their textbooks and library books could contain bias in the graphics or language used. When shown science trade books which were randomly selected from the library in which the discussion took place, they failed to agree that having pictures of females would change the book in any way. Again, the teachers stated that the use of the word "man" to refer to all people was generally understood by all students as including women, too. They believed that female students would simply picture themselves in the scene, regardless of the actual person on the page.

On the concept mapping, only one grade level group noted that science books and reference materials must be, "racially and sexually balanced." Two of the groups mentioned bulletin boards and classroom visual aids and the need for these to be bias free. One of the grade level groups did not even mention gender in their concept map of materials or in the discussion of it.

Role Models

> Scenario from Survey
> "As part of our 'future careers' program, we will have four speakers tomorrow morning. Mr. Jacobs will discuss carpentry. Mr. Phillips will talk about the file of medical technology. Dr. Roberts will discuss the role of the physician; and Mr. Morgenthan will tell about his job as a small independent businessman.

Approximately 26% of the group stated that there was not gender bias in this scenario. Only 25% of those who recognized bias stated that the number of male and female speakers should be equal. Only one respondent mentioned having males in "non-traditional" fields, such as hair dresser or florist." All of the other teachers ignored the issue of career choices altogether. The need for female role models in all fields was not recognized as important.

Some of the most startling statements which indicate the need for equity training for teachers were listed under this question.

1. The use of the word "businessman" should be changed to "businessperson." This was seen as the only biased part of the scenario by several teachers.
2. Many said that there were, "No women," and did not even consider the possibility of Dr. Roberts being a woman.
3. "As long as one is a female it is OK," was the sentiment of many teachers. An equal number of speakers was not necessary.
4. "If it is an all boys school then it is OK for all of the speakers to be male. If the school is co-ed then they should at least make an effort to include females."
5. "As long as girls and boys both hear the program, it doesn't matter who speaks."
6. As one person was trying to decide if "Dr. Roberts" was a male, he stated "Probably a man because more men have the ability to become a doctor."
7. "All of these careers are male oriented." It is scary to think that a teacher would believe this and project the idea of male and female careers in the elementary classroom.

During the interviews, a majority of the female teachers who have been teaching for 10 years or more stated that they are not comfortable with science, health and technology subject matter. Some stated that they avoid the subjects and teach only the required number of minutes per week. These teachers do not make good role models for the students in their class. One teacher who had been teaching for 28 years said that she always relied on her male colleague for the presentation of science lessons. This encourages the students to believe that males are better at science than females.

The belief that even elementary age male students are better at science than female students is also reinforced by these teachers in their science classrooms. When asked about the top students in science, more than 57% of the students mentioned were boys. Some teachers even stated, "I suppose that I should mention some girls, since you are interested in that."

Implications

Although the teachers in the science institute stated an awareness of Gender Equity issues, the data collected does not support this claim. While many did recognize blatantly biased situations, the subtle situations were ignored or only one element of the bias was mentioned. One concern is that many of the participants defended sex bias, "because that is the way it has always been done." Our study indicates that more than sensitizing is necessary.

An average of 13 years of teaching experience puts most of the teachers in this study at an age where gender equity issues were not part of their teacher education program. Specific information about the importance of classroom interactions, learning styles of males and females, and the need for women as role models for students must be communicated to practicing teachers. For this to be accomplished, training and follow-up support are needed to help teachers recognize inequities and develop strategies for creating an environment which supports all students.

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The Role of Education in Women's Resiliency: Exploring the Educational Experiences of Successful Women from Disadvantaged Backgrounds

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In this dissertation study, in-depth interviews were conducted with 21 academically high achieving women who were also disadvantaged as children. Qualitative measures were used to explore how education has assisted these women in their academic achievement or set up barriers to their success. At the beginning of this project, my committee was concerned that I might have trouble attracting research participants. My plan was simply to hang flyers on bulletin boards and hope that qualified women would volunteer. Beyond that, I had three or four backup plans in case I received no calls. To my surprise, within two weeks, I had all the volunteers that I needed and started turning callers away. It was obvious that I had "struck a nerve." Not only did this population seem much larger than I had expected, the women that I interviewed continually told me how glad they were that someone was finally paying attention to them. Finally, they had the opportunity to speak their minds. Finally, someone cared about their difficulties. Finally, someone was ready to validate their experiences as women, and women from disadvantaged backgrounds. Although these participants had done well in school, their process had been long and arduous. Each woman had strong feelings and opinions about her education and was enthusiastic about sharing her insights.

Four areas were covered in the literature review. First, the controversy surrounding the definitions of at-risk and disadvantaged is described. At this time, most definitions of at-risk are meant to define students who are doing poorly in school and therefore are at-risk of dropping out. A question is posed whether this definition adequately defines these students when some students do well in school and yet face similar barriers.

Resiliency research is also outlined. Most resiliency research is oriented toward children and is most often found in literature on prevention of disabilities in early childhood. For example, Werner and Smith (1983) conducted longitudinal studies in Hawaii with children who they categorize as vulnerable but invincible. In this study, they followed children who were exposed to biological risks at birth and then raised in less than optimal environments.

Interventions for children from disadvantaged backgrounds was also a topic of discussion. For example, Henry Levin's (1987) *Accelerated Schools Program* has clearly demonstrated that engaging students in a challenging, speeded-up as opposed to a slowed-down curriculum has positive academic and social outcomes.

Finally, recent studies on the education of successful women from non-traditional backgrounds is reviewed. Most research that has solicited input from successful women have focused on women in minority groups or women in particular occupations. For example, Gandara (1982) interviewed 17 Mexican-American women who were from lower socioeconomic backgrounds and who also completed a higher degree. Although these participants did not face traumatic childhood stress, they could easily be labeled disadvantaged not only because of their race and economic status, but also because they were first generation (in this country) and their families spoke only Spanish in the home. In this study, Gandara emphasized familial influences. Her findings showed that a mother's encouragement to persist, a strong work ethic in the family, a nonauthoritarian style of parenting and equal treatment for girls and boys were all important factors in promoting success. The women also attributed some of their success to the fact that they were comfortable with both Hispanic and Anglo culture.

Method

Participants

Twenty-one resilient women were recruited for this study. Women were considered resilient if they had achieved highly in academics and were also disadvantaged as children. To qualify as disadvantaged, the participants had to have these experiences in common, 1) they lived in either a poor working class or lower class family as a child, 2) they were first generation college students, 3) they experienced at least one type of familial dysfunction or traumatic childhood stress (physical and or sexual abuse, alcoholism, drug abuse, mental illness, severe illness and, or other stress). This identified women as disadvantaged if they did not have access to resources in three categories: financial, informational and social/emotional.

To qualify as high achievers, the participants had to have an advanced degree or currently be enrolled as an advanced graduate student with at least two years of graduate work completed. Women were recruited from all disciplines including, but not limited to, education, law, medicine, engineering, business, literature and psychology. Participants were recruited by advertising through flyers at two major universities.

The group of resilient participants included representatives from different ethnic groups including, African-American, European-American and Hispanic. Although the goal of this research was not to compare women with different ethnic backgrounds, research shows that a disportionate number of women in ethnic minority groups suffer from childhood poverty and stress. It was important to represent diverse perspectives.

Data Collection Methods and Procedures

This was an exploratory study, therefore, specific hypotheses were not listed. The purpose of this study was hypothesis generating. Data were collected in three ways, through in-depth interviews, questionnaires and historical records. When appropriate, information from one source was used to substantiate information provided from another.

Interviews. In-depth personal interviews were used to describe and explain the educational experiences of each participant. These interviews provided the opportunity to explore in detail each participant's ideas and feelings about her education. The interviews were open-ended; the interviewer guided the inquiry, but the participants were allowed to discuss in detail what they considered important about their lives and their educational experiences. The interviews were audiotaped and then transcribed verbatim in preparation for analysis.

Questionnaire. After the interview was completed, an experience questionnaire was administered to each participant. The design of this questionnaire was guided by pilot study findings. The questionnaire provided a second opportunity for the participants to express their attitudes about education in a completely different format. The answers from the questionnaires were compared to the interview data to ensure that consistent answers were provided by each participant.

Transcripts. Historical records were also used as a third and final check for consistency. Participants were asked to sign a letter of permission so that the investigator could send away for transcripts from high schools, colleges and graduate schools. By analyzing transcripts, not only was the investigator able to compare actual records with self-report data, but these records were also used to identify the types of classes taken by individual students, grade levels in certain subjects, patterns of class enrollment and elements of transition from high school to college.

Data Analysis

The challenge of qualitative data analysis is to make sense of massive amounts of data, identify significant patterns, and construct a framework for communicating the essence of what the data reveal (Patton, 1990). Transcripts were made from each interview and descriptive data were presented in a way that people could draw their own conclusions. For example, dialog quotes were coded and listed as evidence, and demographic information was presented in tables.

Interviews were analyzed with an inductive cross-case analysis. Inductive analysis means that the patterns, themes and categories emerged out of the data rather than being imposed on them prior to data collection and analysis. A cross-case analysis means that the information was grouped together according to different people, themes, perspectives or issues. In this project, data was organized topically and a content analysis was conducted which included the process of identifying, coding, and categorizing the primary patterns in the data. After that process, a case record was developed. The participants' case records included all the most important information used in the final analysis. In the final step, the data was interpreted. Interpretation, by definition, goes beyond description. Interpretation means attaching significance to what was found, offering explanations, drawing conclusions, making inferences, building linkages, attaching meanings, imposing order and dealing with rival explanations.

Rigor

Within the positivist paradigm, a study's rigor is judged through measures of reliability and validity. Lincoln and Guba (1985) present a strong case against the use of these terms within a qualitative paradigm since the purpose of qualitative research is to further understanding without reference to causality. In response, Lincoln and Guba have offered the following four alternative terms which are more applicable in determining the rigor of a study conducted within an interpretivistic paradigm including, credibility, comfirmability, dependability and transferability.

Credibility refers to the researcher's ability to conduct the study in a manner which ensures that the subject is accurately identified and described. Researchers historically have not trusted self-report data. The interview data was cross-checked with information provided in the questionnaires and in other historical documentation (transcripts). As an additional check for credibility, the women in this study were given a copy of the final report and asked to provide feedback on whether or not the results accurately reflected their voices.

In qualitative research, investigators also strive for *confirmability*. To check my interpretations of the women's interviews, two outside observers (in addition to the dissertation committee members) were asked to evaluate the interpretations. Both outside observers were men. One outside observer is a psychologist who has ten years of clinical experience. The second outside observer has a Ph.D. in mechanical engineering. By allowing the interpretations to be checked by two people with perspectives other than that of the researcher, additional objectivity was added to the evaluation process.

Dependability refers to the researchers attempts to account for changes in the design created by a refined understanding of the setting, This represents assumptions different from those shaping the concept of reliability. Positivists assume an unchanging universe where an inquiry could be replicated. Interpretivists believe that the social world is always changing and replication is itself problematic (Marshall & Rossmanm, 1989) It was not necessary to make changes during the current investigation. However, the interviews were open-ended and although the focus of this research was on education, the women often talked about their family of origin. Therefore, women were allowed to discuss relevant issues whether or not they related to education.

Finally, *transferability* refers to the applicability of the findings to other settings, contexts and groups. The results of this study cannot be generalized to other women who have achieved highly in academics and who were also disadvantaged as children. However, by using detailed information that was gathered through multiple methods, other researchers can explore the data and the results and determine the applicability of the findings to their specific situations. Triangulation of methods through the use of multiple cases, multiple outside observers, multiple sources of data and multiple theories strengthen the transferability of the results.

Results

The results of the dissertation study were organized into five chapters and will be summarized in that way. These five chapters include, 1) relationship to disadvantage, 2) personalities of resilient women 3) what women want from schools 4) patterns of achievement and development, and 5) family and community influences. In this study, an attempt was made to determine how a variety of influences worked together to produce positive outcomes.

Relationship with Disadvantage

Even as adults, none of the participants considered themselves disadvantaged. As children, they had no idea they were disadvantaged. Furthermore, the women who were ethnic minorities down-played racial issues. How women define and experience disadvantage and race can be important, especially if people achieve at higher levels when they are not aware, or do not acknowledge, their disadvantages. In this study, women blamed themselves, rather than the system, for their difficulties. Yet, they attributed their success to family members or school interventions. These women had extremely high standards for themselves and saw achievement as completely dependent on their own abilities, not on the school and not on their family. Also, most of the women believed they achieved at a higher level because professionals in educational settings did not know who they were as individuals.

Did these attitudes allow the women to achieve at the level they now enjoy? or did they drain their energy, making academic achievement a difficult challenge? The data in this study suggest that these women faced consequences from hiding their true identity. For example, women felt they were different and ultimately believed they did not belong in positions historically reserved for the privileged majority. Also, women were not able to seek help or promote themselves and were often misevaluated as a result. So, although these women were independent, and able to achieve, these women had to struggle to reach their full potential.

Personalities of Resilient Women

Some of the participants' common personality traits were explored in detail. Often, investigators ignore the influence of personality and focus on family functioning. This is unfortunate since high achieving children often have siblings who do not achieve highly. In this study, personality, and individual responses to environment, were considered important. The common personality traits discussed include, maturity, confidence, benevolence, perfectionism and perseverance.

These women were independent and mature for their age which made them more interested in an independent (adult-like) style of education. Unfortunately, it also caused educators and counselors to believe these women did not need help. So, often they did not receive adequate counseling in high school and college.

Most of these women grew up as good girls (even those who described themselves as precocious) and later became women who cared about making the world a better place to live. This is important because many girls act nice to gain the teacher's attention which causes the teacher to respond positively to their behavior and pay less attention to their academic needs. This may provide some explanation as to why girls often do well in elementary school and do less well in high school.

The women in this study were ambivalent about their confidence. Sometimes they were confident to the point of arrogance and at other times they were afraid to talk to professors because they felt unworthy. Ultimately, they found enough confidence to try even when they faced rejection.

The women were also perfectionists. Although this trait helped them achieve at a high level, it also made the educational process more unpleasant because their style was at odds with instructional methods that focus on what students do wrong. The participants were dependent on positive feedback from school. Criticism was intolerable.

Finally, the women were persistent, but in a way that precluded them from recognizing the difference between the level of work they demanded of themselves compared to that required of other students. For example, many believed that working full-time during school was a normal way to support themselves through college. There was no recognition that many other students did not work full-time during their undergraduate experience.

What did Women Want from Schools?

What women need from teachers. With 21 participants, it was possible to recognize some common educational needs and experiences. First, teachers' personalities were more important than their teaching style. Participants claimed they could easily adapt to different styles, but it was important for them to have teachers who were caring and attentive. Participants were also interested in teachers who were somehow different. They connected with radical teachers who were nontraditional in their teaching style.

Participants also mentioned their disappointment in female professors. Although these professors were role models, they were not as supportive as was expected. Many of the participants felt that female professors acted like men (e.g., competitive and ambitious) to compete successfully in a educational system developed by and for men. Also, the participants not only wanted women teachers, they wanted women who were like them. For example, they wanted to see women of color and women from disadvantaged backgrounds in positions of power. Many thought that women who achieved highly were all Caucasian women who had come from privileged backgrounds.

Guidance and mentors. Only a few of the participants had any guidance in high school. There is some evidence of discrimination. For example, some students received bad counseling. In these cases, the participants were told they should pursue careers as secretaries or grocery clerks even though their grades were high and they were interested in college. In most cases however, the participants believed that professionals in the schools did not know, or were not fully aware, of their disadvantage. Results suggest that the participants' disadvantages affected them in a way that made it difficult for them to take advantage of the counseling opportunities that were available. These women did not know how to seek advice or were too scared to ask for help

Guidance in college was also important. Those who had mentors were aware of the importance of that guidance. The women who did not have the proper guidance chose the wrong majors, attended the wrong schools and expended extra energy to accomplish at levels comparable to those with mentors. Not only did each woman need academic guidance, it was also important for each women to be validated for being smart or special. In fact, it was important for these women to get validation for being above average. When the participants were considered average or below average, they often felt as though they should quit or change directions. Success in school strengthened their self-esteem, when often it was being weakened at home.

Ingrained structure and attitudes that discourage learning. The participants provided examples of the norms and structures within the school system that discouraged their progress. Many problems stemmed from a hierarchical system that encourages certain behaviors and attitudes. For example, people on the bottom of a hierarchy are often expected to be compliant and to show deference to those in positions above them. This structure is offensive to these women because they want to be valued as an equal. These women believed they have had more life experiences than their privileged counterparts and therefore had difficulty accepting the traditional role of a student or as a low level professor who is considered inexperienced and less knowledgeable. Another reason that women have difficulty accepting a hierarchical structure is because they were often at the bottom of an abusive hierarchy associated with their families. In these situations, they had no control or recourse for unfair treatment. For this reason, they were uncomfortable when they found this structure replicated in the school system. Some of the structures that are in place to support the hierarchical school system are the elitist way colleges are stratified, traditional testing methods that misevaluate nontraditional students, and competitive, rather than cooperative, methods of teaching and learning.

Patterns of Academic Achievement and Intellectual Development

It was found that these women did very well in elementary and graduate school and did less well in high school and college. The data suggest that these women enjoyed the individualized attention in elementary and graduate school, and they were more comfortable in graduate school when they were given the opportunity to decide what was important for them to learn.

The data also suggest that these women developed higher level thinking skills at an early age. Unfortunately, since they did not always present themselves well, they were evaluated inaccurately and provided with educational opportunities that bored them. Later, these women often felt they had special abilities and were disappointed when these abilities were never (or seldom) recognized.

Family and Community Influence

It is surprising that even those participants who faced an enormous amount of childhood stress described at least one member of their family as influential. In fact, many participants listed family members (especially mothers) as the one factor in their lives that was most important in helping them achieve.

When the women spoke about significant others, usually they described them as helpful and encouraging. However, some were not, especially when the women had experienced traumatic divorces during their school experience. None of the women credited their husbands, boyfriends or significant others for their achievement. However, many claimed that their children motivated them to continue because they wanted to provide something "better" for them.

Women also mentioned the importance of the community. Although their experiences were most affected by their family of origin, their extended family, friends and neighbors were also helpful at various times.

Conclusions

The problems today in providing protective interventions for disadvantaged children do not arise because we lack consensus that something needs to be done. The problems are that we do not know how to define disadvantage, we do not recognize and acknowledge the diversity in children's disadvantages, we do not have the resources to provide necessary services and when services are provided, they are defined narrowly without regard for individual needs.

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Creating a More Equitable Computing Environment

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National studies show increasing numbers of female students in higher education. However, despite increased college enrollment, women nationwide continue to be underrepresented in the sciences (Eisberg, 1993; Tobias, 1990). Studies also show that female representation in computer-related majors echoes the pattern of women in science, generally. Women are woefully underrepresented (Frenkel, 1990). A midwestern state university with a student body numbering approximately 8,500 mirrors the trend of increased enrollment; women there now represent more than half of the enrolled students. Unfortunately the midwestern university also mirrors the trend of female underrepresentation in the sciences generally and the computing discipline specifically. While females represented 28% of computing majors in 1986, their relative numbers had fallen to 26% by 1992. The fact that the percentage of women in the major declines even as the percentage of women on campus is rising is obviously a cause of great concern.

We know that technological skills will become increasingly important as our country enters the 21st century. Consider the following excerpt from The AAUW (1992) report, *How Schools ShortChange Girls:*

> A well-educated work force is essential to the country's economic development, yet girls are systematically discouraged from courses of study essential to their future employability and economic well-being. Girls are being steered away from the very courses required for their productive participation in the future of America, and we as a nation are losing more than one-half of our human potential. By the turn of the century, two out of three new entrants into the work force will be women and minorities. This work force will have fewer and fewer decently paid openings for the unskilled. It will require strength in science, mathematics, and technology (p. v).

Well-paying professional opportunities in information systems await qualified applicants. In light of the traditional Euro-American male dominance of the field and years of national concern with affirmative action, businesses seek out qualified women and minorities. In view of acknowledged career opportunities and known financial advantages, why does interest--especially female interest--in the discipline continue to decline?

We know that women who persist in computing are just as successful as men. We also know that women who are just as competent as ultimately successful men become discouraged and leave (Frenkel, 1990). Why is this? Many reasons are given. One explanation suggests that girls grow up viewing computing as a male-oriented activity. Another says that women feel isolated in classes populated almost exclusively by men. Still another posits that women lack confidence in their ability to succeed (Eisberg, 1993; Frenkel, 1990; Teague, 1993).

Whatever the cause, we need to ask: What can be done to reverse the trends of female underrepresentation and lack of persistence? With an expressed goal of increasing female participation in mathematics, science, and technology (M/S/T), the *Teacher Education Equity Project* is one project specifically designed to reverse these trends. The 60 project participants, selected in a nationwide competition, are all teacher educators who teach M/S/T methods courses to preservice teachers. During the selection process "technology education" was apparently interpreted broadly, resulting in a mixed bag of technology educators. Most of the project's technology participants teach preservice teachers in non-computing disciplines how to incorporate computers into elementary or secondary classrooms. A few are vocational teacher educators. To the best of my knowledge, I am the project's only computer science teacher educator. I am also one of a very few participants who teach content courses (in a Letters and Science Mathematics and Computing Department) in addition to an education methods course. As a result, my experience integrating gender equity issues into instruction is likely to differ somewhat from that of other participants.

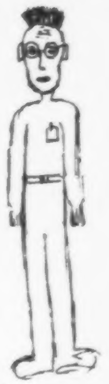
The *Teacher Education Equity Project* staff developed a collection of gender equity modules that were presented at the opening seminar. Participants agreed, as a condition of project participation, to incorporate some of the modules into their methods curricula. Some computer-related activities, such as examining popular computing magazines for gender bias or asking youngsters to draw a computer scientist, are designed to increase awareness of gender issues. Others, such as increasing wait time and calling on more females during large group recitation, are designed to reform teaching practice directly. This paper reports the results of initial efforts to sensitize preservice computer teachers to gender equity issues. Additionally it reports on efforts to reform teaching practice in computer programming classrooms.

Increasing Awareness

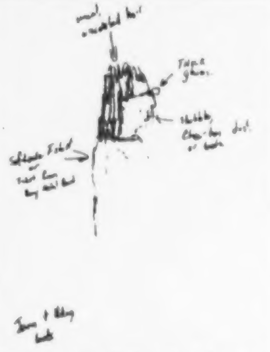
The methods course syllabus stated that gender equity would be a recurring theme throughout the semester. During one of the first sessions, we talked about the gender issue. Then I asked the preservice teachers to draw a computer scientist. Despite the syllabus and the preceding discussion, all five methods students--two traditional females, one traditional male, and two non-traditional males--drew males. What is perhaps more disturbing is that the five attractive people all drew unattractive males. Two are shown here.

Each pre-service student was also required to interview an adolescent computing student. Some interviews included computer scientist drawings. The depiction of one young male who intends to pursue computing as a career is included here.

During a recent National Council of Teachers of Mathematics (NCTM) presentation on early childhood computing, a roomful of professionals did the same exercise. Although the audience was almost exclusively female, only four drew female computer scientists. None drew disabled or African-American computer scientists.



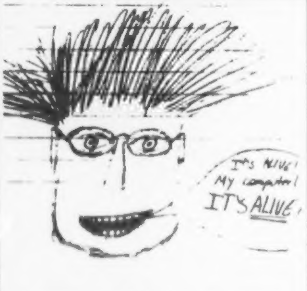
Computer Scientist drawn by a female preservice computing teacher



Computer Scientist drawn by a male preservice computing teacher

These are the perceptions of people who belong to the computer culture, the people who will be teaching the next generation of students and and the people who are the next generation of computer professionals. Given the perceptions, should it surprise anyone that many females, especially impressionable young females, regard computing as a "nerdy" male activity?

By becoming aware of the differential expectations we as teachers have for different groups of students we can confront them and perhaps change the expectations. As the semester progressed, I found myself looking at teaching behaviors through a new set of lenses. For example, the methods course description requires that students demonstrate competency using a spreadsheet. As the students, who are computing majors or minors, inevitably know how to use several, I did not devote instructional time to the topic. However, I did require that students construct a gradebook with entries for a minimum of six imaginary students. Of the six required entries in one student's gradebook, five were male names. The five males had final averages ranging from 98% to 100%. The lone female had an average of 83%. Were it not for my own increased awareness, I might have missed the bias. I am certain the student was unaware.


It's Alive!
My computer!
IT'S ALIVE!

Computer Scientist drawn by an adolescent male

Collaborative Learning

Among the reasons given for women's flight from science, one theme recurs constantly--women are uncomfortable in the competitive atmosphere that permeates most introductory science classrooms. From childhood, they have been raised to value cooperation and collaboration (Chisholm, 1993; Eisberg, 1993; Frenkel, 1990; Tobias, 1990). The literature is consistent; women are more comfortable working in collaborative environments than competitive environments, and they are more successful and more persistent when they are comfortable. We know that collaborative learning, including collaborative learning of computer programming, works. The literature abounds with reports of success (Bredehoft, 1991; Cheny, 1977; Davies, 1988; Johhnson & Johnson, 1987). We also know that group work does not guarantee learning for everyone. Group learning situations must be structured carefully if all participants are to benefit (Lemerise, 1993).

We, my colleagues and I, are [computer] science teachers. For most of our lives we have been passive learners, and many of us are quite comfortable in that mold. We look at our best students, and they, too, are passive learners. If we are to change our way of teaching, we need more than a general awareness that collaborative learning can be helpful. We need compelling evidence that it works for our students, and we need it in the form of documented successes.

Last semester I did informal mid-term course evaluations in an advanced computer architecture and assembly language programming class. As group work was frequently mentioned, I surveyed the 31 students regarding their perceptions of group work, asking only that they identify their sex. The results were surprisingly supportive.

Of the 20 males, only one said unequivocally that group work was bad. On the other end of the continuum, one male responded: "Group work is great because it allows other students to show you what you are doing wrong. It is almost like tutoring. Everyone has to take it on themselves to learn the material in group work." A second wrote: "I think that partners are very helpful. By being able to explain what you feel is correct and collaborating on what they feel is correct, I can determine if I am interpreting the question correctly." A third said: "I enjoy the group work. I think it helps a lot. It's helpful to get different perspectives," and a fourth responded: " I think group work is beneficial. Definitely stick with it." In all, 8 of the 20 males gave unqualifed positive responses.

Most male responses gave qualified approval to group work. Interestingly, the males and females who qualified their responses did so in similar ways. Both sexes indicated they preferred to pick their own partners. Both sexes also indicated that small groups of people who worked at approximately the same speed were the most successful. Some preferred that group work be limited to in-class activities. No one opined that out of class team projects were helpful, but that in-class activities were not. Also no one indicated that they preferred to work with members of the same or opposite sex.

On average, the females responded more positively and with fewer qualifications. The only negative female response indicated that non-graded in-class group work was fine, but that the female student preferred to work individually on graded work. Two gave neutral responses. Three qualified their opinions as described previously. However, 5 of the 11 gave unqualified support to the instructional strategy. One wrote: "It's VERY good. Another responded: "Like it." A third said: "Group work is great. Helps me learn more." A fourth responded: "I enjoy working in groups. This way we can discuss what's going on. If we aren't sure of what's going on, it helps clear things up." And the last female said: "I think the group work is very helpful. It allows you to verbalize your thought process which significantly increases the learning/understanding of the material. Also it gives us practice in discussing our work. We will need to do that in whatever business environment we choose to work."

The results of my informal survey appear to reflect the literature on collaborative learning of computer programming. Webb and Lewis (1988) discuss both benefits and cautions about group work. Group ideas, they say, may give rise to the conceptual conflict and resolution that have been hypothesized to facilitate cognitive restructuring. The resolution of disagreements that may occur during group interaction provides opportunities for members to "retrieve prior knowledge, evaluate their own and others' answers, ideas, and opinions, confront their own misunderstandings and lack of knowledge, and as a consequence, restructure their own thinking" (p. 181). The authors cite others who theorize that group activities provide opportunities for modeling and imitation, suggesting that successful peers may be better models than experts, especially for novices with doubts about their capabilities. The authors suggest that communication among peers may be more effective than teacher-student communication. Peers can be more direct. They better "tune in" to each other's problem solving processes and thinking and thus provide more effective feedback. The authors caution on the other hand that positive effects do not take place if all students do not actively participate, if some members lack the requisite skills, or if students fail to get help when they need it.

Computer programming is the foundation of all the computing sciences. Large doses of programming permeate any computing curriculum, particularly at the introductory level (Mawhinney et al., 1990). Unfortunately it is also the component of computing that is most inimical to females; it is the area where they are least likely to persist (Lockheed & Mandinach, 1986). However, we know that those who do persist are successful. Hence we may conclude that improved teaching practice could stem the steady leak of women from the educational computing pipeline. As a consequence, it may help women to take their rightful place in a well-educated, skilled work force of the 21st century.

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Gender Equity through Discovering Voice

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Most higher education institutions are designed and run by men. According to scholar Patricia Palmieri (1976), in order to design an education appropriate for women, we must learn about the academic experiences of women. How women perceive their experiences is critical to how they express their experiences.

College women do not flourish under excessive control and structure. Under such conditions, they will not learn to make choices, they will be motivated by duty rather than desire, and their intellectual development will be stunted rather than being nurtured (Belenky, et. al., 1986). Women need to know that their ideas are good, reliable, and, most of all, heard and taken seriously. In the college world of academics women want some structure in the educational environment, yet, they require freedom to design structures. Nell Noddings in *Caring* says, "It is time for the mother to be heard in education" (Noddings, 1984).

Recent research and models have focused on women's learning and women's ways of knowing. If women are to grow and develop intellectually, they must become aware of their experiences, of their ways of knowing, and of their ways of developing their private and public voices. In the summer of 1993 Dr. Nancy Rule Goldberger presented the findings and the implications of research that she and three colleagues completed in 1986. Their book, *Women's Ways of Knowing,* which won the 1987 Distinguished Publication Award from the Association of Women in Psychology, examines the development of self, voice, and mind. The authors describe five different perspectives from which women women view reality and draw conclusions about truth, knowledge, and authority. They show how women's self-concepts and ways of knowing are intertwined.

The research team of Mary Field Belenky, Blythe McVicker Clinchy, Nancy Rule Goldberger, and Jill Mattuck Tarule, interviewed ordinary women of different ages, ethnic and class backgrounds, and educational histories. The women interviewed told life stories of people and events that were critical in the development of their minds, the ways they viewed themselves, and how they finally found their private and public voices in order to gain control over their lives.

The researchers used the metaphor of voice and silence as the unifying theme that links the chapters of their book. It links the story of the journey of women's discovery of their knowing. They base the metaphor on two fields -- literary and sociolinguists. In her 1978 book, *Silences,* Tillie Olson documents the history of women writers and points out the relative silence of women as literary voices. The field of sociolinguists focuses on male and female patterns of discourse and gender differences in conversational patterns. The researchers found in their interviews that the metaphor applied to many aspects of women's experience and development. In describing their lives, the subjects commonly talked about voice and silence: "really talking," "being silenced," "speaking up," "speaking out," "having no words," and so on in descriptions all having to do with sense of self, sense of mind, self -worth, and feelings of connection or isolation from others. They cited the work of Carol Gilligan (1979) who began hearing a "different voice" as women talked about personal decisions and moral crises.

Paulo Freire (1971) uses the metaphor of "banking" to describe traditional education. The role of the teacher is to fill the student's empty head with information which the teacher considers to be knowledge. The student's role is to "store the deposits." A woman needs to know that her ideas are good. Teachers need to show students their thinking processes -- not just the teacher's finished and perfect product -- "the answer" -- and, not just through the teacher's eyes, but through a sharing of "our" eyes. The women that the researchers interviewed wanted an education where knowledge flowed in many directions: from teacher to student, from student to teacher, from student to student and among others. Freire talks of *partner-teachers.* The authors talk of *midwife-teachers.* We hear educators talking about the *facilitation* of learning today, rather than the traditional model of filling the student's head with information. It is becoming clearer that learning and knowing is indeed a personal journey and an individual's unique process.

In drawing out the voices of the women in their study, the authors found that the voices educated them. The ways of knowing fell into five stages, or as the authors ultimately created, a model of five epistemologies: Silence, Received knowledge, Subjective knowledge, Procedural knowledge, and Constructed knowledge. The authors describe these stages in detail in their book. As women grow and develop, they move through the stages from a separate knower to a connected knower. At times women will find themselves back in the Silence stage when they are thrown into new experiences that are often threatening. Being aware of the stages experienced allows women to feel some power in order to act.

Two other models support the action stage in the education arena. The first model was developed in 1972 by Bernice McCarthy. She developed the 4MAT System to help teachers organize their teaching based of different learning styles of the way students learn. McCarthy used the theories of Carl Jung, John Dewey, Jean Piaget, and David Kolb to develop her system. The underlying assumption of the system is that we learn with our whole minds -- our beliefs, our intuition, and our emotions. In this system women would be supported and the personal path to the development of their minds would be honored.

The second model is based on William Glasser's Quality Schools model. Beyond effective teaching, the model is designed to develop and support teachers who facilitate learning, who collaborate with learners, who encourage learners to take risks, and who empower learners to develop voice. The model describes quality learners, and designs activities and strategies that will lead to quality learning. One of the strategies is built on the premise that "Quality learners have confidence in their ability to learn." Women would be encouraged to to believe that they have abilities to learn. They would be encouraged in their process to find their own path to knowing. Quality learners also are self-evaluators. Women would learn to trust their own ideas and views using this strategy in the Quality Schools model. Teachers empower and teach students to trust their ways of knowing.

The authors emphasize that educators can help women develop their own authentic voices if the educators focus on *connections* rather than on separation. Coollaboration is emphasized over debate. Women must be allowed to develop their own patterns of learning and knowing. If we replace the separate with the connected model, we can "spare women the alienation, repression, and division their schooling currently confers upon them (Jacobus, 1979). "Education conducted on the connected model would help women toward community, power, and integrity " (Belenky, p. 228).

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Voluntary Industry Skill Standards—Integrated Standards and Equity

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Need for National Industry Skill Standards

As America felt the sharp pangs of economic decline in the 70's and 80's, researchers and policy-makers began to rethink our national approach to workforce development and to examine education and employment systems of other countries. The Commission on the Skills of the American Workforce (*America's Choice: High Skills or Low Wages*, 1990) found that countries experiencing economic strength and stability shared a common approach to education and work which included: a) an expectation that all students reach a high education standard; b) a "professionalized" vocational education; c) a comprehensive labor market system combining labor market information, training, job search and income maintenance for the unemployed; d) employer tax supported in-company training; and e) a national consensus on moving towards high productivity work organizations and building high wage economies.

A number of other reports helped begin a process to guide American thinking about the responsibility of the education sector to prepare young people for their futures as fulfilled adults and successful participants in the American economy. *The Forgotten Half* (Grant Foundation) made clear that 50 percent of America's youth who were in the "general track" were graduating without adequate skills to succeed in America's workplaces. *What Work Requires of Schools*, commonly called the *SCANS Report* (Report on the Secretary's Commission on Achieving Necessary Skills, 1991) identified general "workplace know-how" as five basic competencies and a three-part foundation required by all young people to meet the employment demands of America's workplaces. The five competencies specify how young people should: identify, organize, plan and allocate resources; work with others; acquire and use information; understand complex inter-relationships of systems; and work with a variety of technologies. The three-part foundation includes basic skills, thinking skills, and personal qualities.

Congress propelled the issues forward by enacting the "Goals 2000: Educate America Act," which set a national agenda for reform and called for establishing a National Skills Standards Board. The Board would be charged with developing and implementing a national system of voluntary industry skill standards and certification. This parallels the federal initiative to establish national standards in math, science, language arts, and the social sciences.

National Voluntary Skill Standards: What are They?

In anticipation of the work of the National Skill Standards Board, the federal Departments of Education and Labor funded 22 National Voluntary Industry Skill Standards Projects in 1993 and 1994. The industry groups are diverse, ranging from Bioscience and Chemical Processing to Electronics and Human Services. In the first phase, each project identifies what entry-level workers need to know and be able to do to succeed in that industry.

The very term "skill standards" however, can conjure up negative images. For example, standards are often seen as a device to "screen people out" of opportunities, classrooms, or workplaces. Some see them as narrowly defined, practical, hands-on skills, for someone else's children—those who don't possess intellectual or academic abilities. Neither view is correct.

Skill Standards—if designed and used appropriately—are valuable guideposts and benchmarks. They become "output criteria" for employers as they upgrade skills of current workers, recruit new workers, and evaluate effectiveness of training. They provide structure and content for educators as they design programs and develop curriculum to encourage student achievement. They serve as a map for educators and employers as they cooperate to build effective school-to-work systems. They paint a picture for career counselors, teachers, and parents as they introduce students to the world of work. And, they offer a set of challenges for students as they begin to explore career options and prepare for their futures.

The very best skill standards will:

- engage stakeholders from industry, education, and the community in the design and validation process—developing a common language and respect for the contributions of each sector
- encourage restructuring of learning—because they focus on student mastery of both technical and academic skills through problem-solving
- create a framework for implementing alternative assessment strategies such as portfolios, products produced, oral reports, and research projects—to measure the new demands of high performance workplaces
- serve as a guide for the professional development of workplace mentors, teachers, and workplace supervisors—all of whom will be engaged in helping learners succeed.
- promote flexibility about where learning takes place—drawing on the very best mix of workplaces, community settings, and schools
- hold everyone accountable to a higher level of student achievement for all students—promoting effective teaching and learning strategies such as cooperative and team learning and appropriate use of new technologies

Features of the Integrated Industry Skill Standards Model

EDC has developed an Integrated Industry Skill Standards (IISS) Model that draws on the best learning from education and workplace reform. The entire process and the results for the Bioscience Industry are about to be published. Here we describe two elements that have important implications for equity: the concept of a *Training Occupation* and the *IISS* itself.

The concept of a *training occupation* is commonly used in European countries to train youth apprentices. It is a fictitious construct that does not exist in the work place, but is a real outcome goal for education and training. It combines all of the knowledge, skills and attributes required to perform the full range of tasks conducted by a group of related real life occupations. By preparing for a training occupation, a person will be more extensively qualified for work in a number of different but related jobs within an industry. That person will be positioned to move into a variety of career paths. Such a cross-trained worker is more productive in a workplace where teamwork is required, or where job rotation occurs. A person prepared for a training occupation also is better able to adapt to new technologies or work systems, or to new jobs in restructured work organizations.

For example, the training occupation for the Bioscience Industry is defined as follows: The Bioscience Technical Specialist I performs experiments and assays, manufactures products, or assists with research, using a variety of technical skills under supervision. Nineteen entry level laboratory-based jobs which share a common base of skills and knowledge requirements comprise this training occupation. Some of these include: Animal Technician, Assay Analyst, Clinical/Medical Lab Technician, Cyto-prep Technician, Manufacturing Operator, Pilot Plant Operator, and Research Technician. The training occupation crosses the sectors of biotechnology, pharmaceuticals and clinical laboratories.

The *IISS* consists of a structured "scenario" which represents a typical, real-life work problem; the skills, tasks, knowledge, and attitudes embedded within that problem; and the criteria for successful mastery of those work tasks.

One of the Integrated Skill Standards for Bioscience includes the following problem:

> *One part of your laboratory responsibilities is to safely unpack and process biological samples. Demonstrate everything you would do to accomplish this. While unpacking samples one morning, you notice that one of the samples is leaking from the container. According to regulations, what should you do?*

This problem challenges the learner to think and act. Tasks include: a) take and document corrective action according to SOP or as directed; b) notify appropriate person about problems and observations; c) document communication of information; and d) maintain professional demeanor. Some of the industry related skills to be demonstrated include aseptic technique, basic laboratory procedures, recognition of environmental hazards, stress management and troubleshooting.

By focusing on the problem scenario, individuals are required to rise from demonstrating mastery of isolated tasks to demonstrating mastery within the context of a real workplace problem. This larger definition of "standard" allows for individuals with varying approaches to problem solving and task mastery to "work through to the solution" and increases the chances that they will succeed in education, training and workplaces. The scenarios are constructed deliberately to offer more than one "right way" to master a task and get the work done well.

Integrated Industry Skill Standards: Promoting Equity, Achievement and Choice

The IISS model sets forth the high and real demands of industry. It also builds on the strength of diversity by *promoting* alternative ways of learning—including the kinds of learning that research tells us holds promise for girls and students of color. The IISS model supports equity and excellence because it:

- *reflects the reality of the workplace*. Front line workers—women and men of diverse backgrounds—are involved actively in constructing the standards. Shoulder to shoulder with peers across all sectors of the industry, workers convey their excitement and pride as they identify the building blocks of the standards. In this process, they also share priority issues, difficulties, and the day-to-day concerns they face in carrying out their work. After scenarios are completed, workers validate the standards against which they are measured. Young women will have a new window on the world—to understand "what it's like" to work in promising industries that offer good income and career opportunities.

- *sets clear, high expectations.* Everyone agrees that having high expectations for all students, and particularly for women in math and science-related occupations is a critical variable in student success. But what does that mean? The IISS standards provide a clear set of expectations that are visible, concrete, and recognized by industries—something that everyone can see and understand. The IISS model offers a much more inviting way for girls and women to "see" what is expected and to relate that to their own interests and talents. It also helps "gatekeepers" to learn about the industry and what it requires. Often, counselors, teachers, and parents are not aware of the kinds of the unique problems being solved in various industries or of the common problems that show up across industries. As a result they often "persuade" girls and women to think narrowly about career choices—with the net effect of lowering student expectations, and limiting student participation in important courses such as algebra and science.

- *increases options.* Providing young people with a broad set of industry skills that demand both academic and applied learning will enable them to move directly to work settings, to higher education and training programs, and/or across industry sectors. This opens up futures, especially for girls and minorities who are often tracked into programs that restrict opportunities for succeeding in higher level mathematics and science or for acquiring the necessary background for college entry—especially in demanding technical courses and careers. As a result, girls and people of color are "left out" or spend endless time "catching up." Drawing the integrated standards back into the high school curriculum allows students to participate in *any* industry cluster and be fully prepared to take full advantage of the wide array of options and choices available in our highly technical workplaces and in higher education.

- *encourages new teaching and learning strategies.* The integrated standards recognize and accommodate diverse learning styles and multiple intelligences, often untapped by teachers. They encourage students to pursue alternative ways to pose and solve problems, display their talents, use their own special ways of thinking, and demonstrate competency—individually and in teams. It draws on the research that tells us how to involve girls effectively in the classroom and build on their strengths. As a result, the model also influences teachers to learn new pedagogies and broaden their own repertoire of teaching styles.

- *provides rich content, context and meaning.* The standards are context-rich. The scenarios reveal the "energy" of the workplaces, the discovery process, and how people must keep learning at the workplace to hone their skills and respond to changing environments. Students can "find" themselves in these real situations. The development of challenging math, science, social studies and communication skills embedded in the scenarios give all students a solid grounding in both technology and liberal arts. Giving girls an opportunity to find their own meaning in this rich landscape—rather than mastering isolated tasks—will provide a more balanced environment in which they can thrive and succeed.

- *develops high-performance workplace skills.* Everyone is trying to move toward the concept of high performance workplaces where continuous quality improvement and flexibility are key values and the employee is considered the most valuable asset. Essential elements of the IISS model are teaming, problem—based learning, constructivist learning, contextual learning, higher-order thinking and cooperative learning. Coincidentally, these are the very "ways of learning" that come more easily to girls and women—and are often missing from many classrooms and workplaces.

- *invites alternative assessments.* Standardized tests are only one way of measuring progress. The IISS model demands that we rethink how and when students can demonstrate what they know and what they can do. These include written and oral reports, technical papers, projects, presentations and portfolios, computer simulations, panel reviews by employers and educators, and continuous evaluation and feedback loops. The IISS model invites students to present their accomplishments and meet standards in a variety of ways. If the standard is mutually acceptable and acknowledged by teachers, industry, labor, and higher education gatekeepers, there will be fewer surprises when girls and women apply for jobs or college entrance. The work they have done will be valid and portable.

Integrated Industry Skill Standards provide a unique opportunity to frame education and training programs in new ways, not only to create a high skilled technical workforce, but to ensure that equity and diversity are not lost in the economic reform agenda.

National Skill Standards Projects

Industry	*Contact*	*Address*
Health Care	Sri Ananda 415-241-2725	Far West Lab for Educational R&D 730 Harrison Street San Francisco, CA 94107-1242
Electronics (DOL)	Cheryl Fields Tyler 408-987-4267	American Electronics Association 5201 Great American Pkwy Santa Clara, CA 95054
Heavy Highway/Utility Construction and Environmental Remediation and Demolition	John Tippie/ James Warren 203-974-0800	Laborers-AGC Education & Training Fund 37 Deerfield Rd, Box 37 Pomfret Center, CT 06259
Chemical Process	Kenneth Chapman 202-872-8734	American Chemical Society 1155 16th Street, NW Washington, DC 20036
Hospitality and Tourism	Doug Adair Sally Conway 202-	Council on Hotel, Restaurant and Institutional Education 1200 17th Street, NW Washington, DC 20036-3097
Electronics	Irwin Kaplan 202-955-5817	Electronics Industries Foundation 919 18th Street, NW Washington, DC 20006
Computer Aided Drafting and Design	John Morrison/ Jane Beardsworth 202-637-3426	FIM 1331 Pennsylvania Avenue, NW Ste. 1410, North Tower Washington, DC 20004-1703
Advanced Manufacturing	C.J. Shroll Sally O'Dowd 202-662-8965	FIM 1331 Pennsylvania Avenue, NW Ste. 1081, North Tower Washington, DC 20004-1703
Industrial Laundry	Geoffrey Northey 202-296-6744	Uniform and Textile Service Assoc. 1730 M Street, NW, Ste. 610 Washington, DC 20036

Retail Trade	Robert Hall 202-783-7971	National Retail Federation 325 7th Street, NW, Ste. 1000 Washington, DC 20000
Welding	Nelson Wall Charles Fassinger 305-443-9353	American Welding Society 550 NW LeJeune Road Miami, FL 33126
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Automobile, Autobody, and Truck Technician	Patricia Lundquist 703-713-0100	National Automotive Technicians Education Foundation 13505 Dulles Technology Drive Herndon, VA 22071-3415
Grocery	Jim Williams 703-437-5300	Grocers Research and Education Foundation 1825 Samuel Morse Drive Reston, VA 22090
Agricultural Biotechnology	Bernard L. Staller 703-360-3600	National FFA Foundation P.O. Box 15160 Alexandria, VA 22309-0160

PROMOTING GENDER EQUITY IN MODEL INSTRUCTIONAL PROGRAMS

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We have used several strategies to promote gender equity in science and mathematics classrooms at the K-16 levels in North Carolina. These strategies have been embodied in three programs initially funded by the National Science Foundation and the U.S. Department of Education: *Physics and the 3 Rs, ZOO CONCEPTS, and Technology Tools for Science and Mathematics Learning*. The first of these programs is targeted at the university level, ZOO CONCEPTS is aimed at levels K-6, and Technology Tools is designed for middle and high school levels.

Physics and the 3 Rs is a model laboratory course in introductory physics that employs a variety of methods to attract and retain women and minority students in the science pipeline. The goals of the course are (1) to restructure introductory physics courses by changing the role of students from observers of science to doers of science, (2) to aggressively recruit female students into the sciences and (3) to implement a plan to retain these students as science majors.

The traditional lecture course was replaced with a microcomputer based laboratory course modeled after Workshop Physics, pioneered by Priscilla Laws et al. of Dickinson College. Students meet for two hour labs, three times per week, and are engaged in studying physical phenomena by observing, measuring and analyzing in real time, using high speed data acquisition equipment, computer hardware and various software tools. The students work in peer groups at lab stations, using prepared written material and guided by instructors as the need arises. Faculty and graduate assistants are facilitators rather than instructors in the usual sense. Exams are given to ensure comprehension of traditional material, but grades reflect a portfolio of work done in a scientific team environment, both during class hours and as part of extended investigative studies administered throughout the semester. The working environment encourages collegiality, cooperative learning and a sense of belonging to a scientific community. The working environment also allows students to become extremely competent at using computers as a multifaceted tool: data acquisition and analysis device as well as a powerful publishing tool. Female role models are brought into the classroom to lead discussions which give students a better understanding of the nature of women in the science world. We measure the success of these strategies by analyzing student attitudinal surveys, performance outcomes, career choices and selection of future courses in science and mathematics. A longitudinal study will continue beyond the duration of the funded program.

We will present trends and comparison with a traditional lecture format class from three years of using this approach.

ZOO CONCEPTS, funded in part by the U.S. Department of Education National Eisenhower Program for Science and Mathematics, is a joint program between the University of North Carolina at Greensboro and the North Carolina Zoological Park. Targeted at grades K through 6, *ZOO CONCEPTS* is a professional development program for teachers that uses zoos, and zoo plants and animals as *tools* for teaching science and mathematics *concepts*. The project actively recruits female and minority participants who are traditionally under trained in the sciences.

ZOO CONCEPTS training focuses on encouraging participants to change their classroom instructional practices in a variety of ways including adopting a constructivist model of instruction and increasing teacher awareness of and sensitivity to issues of gender and ethnicity in the science and mathematics classroom. The principal tool for addressing classroom equity issues over the course of workshop training is the GESA[1] (Gender/Ethnic Awareness and Student Achievement) Program, and aspects of GESA training are incorporated into every workshop session.

Based on an analysis of teacher surveys, the use of GESA awareness sessions to confront and discuss gender issues as they impact science and mathematics instruction, has been a useful strategy for raising teachers' awareness of their own biases, and for contributing to changes both in teacher classroom behavior and teacher expectations of students. The project's success in altering teachers' classroom behavior with regard to equity issues has mirrored its success in changing teachers' approaches to instruction, according to the findings of the independent evaluator.[2] In the first three years of the project's operation (1991-94), over 90 percent of participants surveyed reported that they had incorporated the essential elements of a constructivist approach into their teaching and instruction, and over 80 percent indicated an increased sensitivity to issues of gender and ethnic equity by making a conscious effort to change the way they interacted with all students in the teaching of science and mathematics.[3]

The GESA program is designed "to help teachers make constructive changes in the way they interact with students and, in so doing, to free themselves from stereotypical race and gender roles and expectations."[4] The program's developers conduct workshop programs throughout the nation to train GESA facilitators who can work with local schools and school districts to implement the program. The ZOO CONCEPTS Project Director and two members of the NC Zoo's Education Division (including the Curator of Education), underwent GESA training specifically for the purpose of incorporating the program into ZOO CONCEPTS workshop training.

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[1] GESA, Gender/Ethnic Expectations and Student Achievement. Dolores A. Grayson and Mary Dahlberg Martin. Distributed by GRAYMILL , Rt. 1 - Box 45, Earlham, Iowa 50072 [(515) 834-2431. Revised Edition, 1990.

[2] Dr. Lloyd Bond, Professor, Department of Educational Research Methodology, School of Education, University of North Carolina at Greensboro.

[3] ZOO CONCEPTS Final Report, January 15, 1995, page 15.

[4] GESA Facilitator Manual, Revised Edition, 1990. GRAYMILL, Introduction.

GESA offers two types of training. The first, is a five month in service program in which a collaboration is established between interested teachers in a school or school system, and a trained GESA facilitator. The facilitator undertakes to assist with organizational responsibilities for the program, and to support participating teachers who, using the GESA teacher handbook as a guide, work together to conduct the discussions and behavioral observations that constitute the meat of the program.

Based on educational research over the last twenty years, six "areas of diversity" have been identified by GESA program developers to be "applicable to concerns related to gender, race, national origin, developmental or physical disability, socioeconomic class, perceived ability, or any of the labels which tend to deal people our or permit them to deal themselves in or out of the educational system."[5] Workshop activities focus on these six instructional topics: a) Instructional Contact with students (including student response opportunities, acknowledgment/feedback behaviors); b) Curriculum Issues (including evaluating instructional materials for bias); c) Classroom Grouping and Organization (including amount of wait time for student responses, and physical closeness between students and teacher); d) Classroom Management and Discipline (including touching and reproof); e) Enhancing Self-Esteem/Self-Concept (including probing, listening), and f) Evaluation of Performance (including higher level questioning, and analytical feedback). Participating teachers discuss one of each these topics in their monthly workshop session, and determine together the strategies they each intend to employ in order to address the topic in their classroom in a way that increases equity. Throughout the remainder of the month, teachers observe each other's classrooms with regard to that month's instructional topic, and write confidential evaluations based on their observations, which are shared only with that colleague.

A second type of GESA training, which is the part of the GESA program selected for use in the ZOO CONCEPTS workshops, is the GESA Awareness session. In these sessions, lasting anywhere from 45 minutes to an hour, group activities are used to introduce teachers to the equity issues surrounding one of the above instructional topics. A discussion period follows each activity, in which teachers share their experiences, and the facilitator often shares the results of research that has been conducted on the issue. The goal of the Awareness sessions is consciousness-raising--helping teachers to become aware of their own stereotypes and biases, and how their attitudes translate into classroom behaviors that can have a negative impact on one or more categories of students.

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[5] Ibid., page 1.

An important finding over the course of implementing GESA Awareness sessions into the workshop program, was the need to devote time *in the very first workshop* to explaining how gender/ethnic issues are integral to effective mathematics and science instruction. Such explanations proved critical to teachers' enthusiastic acceptance of this component of ZOO CONCEPTS. This strategy also proved highly successful in creating enthusiasm for the project, as well as in developing an understanding among teachers of the project's overall concepts, methodologies, goals, and expectations as related to improving instruction in the sciences and mathematics. As a consequence of daily workshop evaluations, the content and structure of staff presentations on GESA were refined and improved throughout the life of the project in response to teachers' suggestions and comments.

We will present activities and discuss specific results of this approach in a professional development program.

Technology Tools for Science and Mathematics Learning (TechTools) is a professional development program that is developing workshops for teachers in the use of technological tools in science and mathematics instruction at the middle and high school levels. Ten TechTools training sites are being established across North Carolina. A major goal of the program is to increase equity for females in the realm of technology in an effort to counteract the existing 'technology culture' which shows signs of becoming more, rather than less, male dominated. A major assumption underlying the TechTools training model is that technology can and should be a vehicle for promoting gender equity.

One of the tools which will be emphasized is the effective use of the Internet as a means of accessing useful information. Recent evidence suggests that general use of the Net is being dominated by males. A research component included in the project focuses on gender issues as they relate to science and technology, including ways in which both teachers and their students access the World Wide Web to search for and use information. The first series of workshops for teachers across North Carolina begin in June, 1995.

Preliminary data will be presented including a discussion of our attempts to identify the social context of technology acquisition and, based on these findings, to introduce strategies for promoting gender equity in the instructional technology arena.

FEMINISM AND DIVERSITY: TRANSFORMING THE CURRICULUM FOR TRAINING RESEARCHERS IN EDUCATION AND PSYCHOLOGY

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Feminist and multicultural perspectives in research are not typically taught to students in their research methods courses, nor are they represented in the most commonly used research methods text books (Lopez and Mertens, 1993). This omission in the graduate level training of educators and psychologists is serious. These students will become the professionals who conduct research in the future and train future generations of researchers. The purpose of my presentation is to explicate a theoretical framework that is inclusive of the perspectives of oppressed groups that can be used to teach research methodology without discarding what we know from traditional research paradigms.

My ideas have developed from an extensive reading of literature on research methodology from the perspectives of feminists, ethnic minorities, persons with disabilities, and other persons who experience systemic oppression. Three years ago, I developed, implemented, and assessed the curriculum of the graduate level research methods classes that I teach to include the perspectives of oppressed groups. Based on student feedback, discussion with my professional peers, and my personal experiences in implementing this way of looking at research, I have modified my courses each semester. The ideas that I describe herein represent a theoretical framework that can be used in the curriculum for training researchers in the emancipatory perspective.

Alternative Paradigms: Ways of Looking at the World

A *paradigm* is a way of looking at the world. It is composed of certain philosophical assumptions that guide and direct thinking and action. Trying to categorize all educational and psychological research into a few paradigms is a complex, and perhaps, impossible task. Guba and Lincoln (1994) identified three questions which help define a paradigm:

(1) The ontological question asks: What is the nature of reality?
(2) The epistemological question asks: What is the nature of knowledge and the relationship between the knower and the would-be known?
(3) The methodological question asks: How can the knower go about obtaining the desired knowledge and understandings?

The lines between the major paradigms are not altogether clear in practice. However, researchers should be able to identify the "world view" that most closely approximates their own in order to guide their thinking and practice. Answers to the three defining questions are summarized for three of the major paradigms in the remainder of this paper.

Positivism/Postpositivism

The dominant paradigm that has guided educational and psychological research has been that of positivism, and its successor, post-positivism. Positivism is based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, August Comte and Emanuel Kant.

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The underlying assumptions of positivism include the belief that the social world can be studied in the same way as the natural world; that there is a method for studying the social world that is value-free, and that explanations of a causal nature can be provided.

Ontology. The positivists hold that one reality exists and that it is the researcher's job to discover that reality (naive realism) (Guba & Lincoln, 1994). The postpositivists concurred that a reality does exist, but that it can only be know imperfectly because of the researcher's human limitations (critical realism). Therefore, researchers can discover "reality" within a certain realm of probability. They cannot "prove" a theory, but they can make a good case by eliminating alternative explanations (Reichardt & Rallis, 1994).

Epistemology. In early positivist thinking, the researcher and the subject of the study were assumed to be independent; i.e., they do not influence each other (Guba & Lincoln, 1994). Postpositivists modified this belief by recognizing that the theories, hypotheses, and background knowledge held by the investigator can strongly influence what is observed (Reichart & Rallis, 1994). This paradigm holds that objectivity is the standard to strive for in research; thus, the researcher should remain neutral to prevent values or biases from influencing the work by following prescribed procedures rigorously.

Methodology. As was mentioned previously, positivists borrowed their experimental methods from the natural sciences. Postpositivists recognized that many of the assumptions required for rigorous application of the scientific method were not appropriate for educational and psychological research with people, therefore, quasi-experimental methods (quasi-experimental meaning: sort of like experimental, but not exactly) were developed (Campbell & Stanley, 1966; Cook & Campbell, 1979). In other words, many times it is not possible to randomly assign subjects to conditions (as one can with plots of land for a study of fertilizers, for example), therefore, researchers devised modifications to the experimental methods of the natural sciences in order to apply them to people. Although qualitative methods can be used within this paradigm, quantitative methods tend to predominate in postpositivist research.

Constructivist Paradigm

Despite the recognition of the theory-ladenness of facts by postpositivists, other researchers questioned the underlying assumptions and methodology of that paradigm. Although Tesch (1990) identified 26 different types of qualitative research, I chose to use the constructivist label for this paradigm because it reflects one of the basic tenets of this theoretical paradigm, i.e., reality is socially constructed. (This is in agreement with Guba and Lincoln (1989).)

The constructivist paradigm emerged based on the philosophy of Edmund Husserl's phenomenology, and Wilhelm Dithey and other German philosophers' study of interpretive understanding called hermeneutics (Eichelberger, 1989; Schwandt, 1994). The basic assumptions guiding the constructivist paradigm are that knowledge is socially constructed by people active in the research process, and researchers should attempt to understand the meaning of events, not their causes. The constructivist paradigm emphasizes that research is a product of the values of researchers and cannot be independent of them.

Ontology. Reality is socially constructed. Therefore, there are multiple mental constructions that can be apprehended, some of which may be in conflict with each other, and perceptions of reality may change throughout the process of the study.

Epistemology. The inquirer and the inquired-into are interlocked in an interactive process; each influences the other. The values that influence the investigator are made explicit. The concept of objectivity is replaced by confirmability (Guba & Lincoln, 1989). The assumption is made that data, interpretations, and outcomes are rooted in contexts and persons apart from the researcher, and not figments of the imagination. Data can be tracked to its sources, and the logic used to assemble interpretations can be made explicit in the narrative.

Methodology. Qualitative methods such as interviews, observations, and document reviews predominate in this paradigm. These are applied in correspondence with the assumption about the social construction of reality in that research can be conducted only through interaction between and among investigator and respondents (Guba & Lincoln, 1994). This interactive approach is sometimes described as hermeneutical and dialectical in that efforts are made to obtain multiple perspectives that yield better interpretations of meanings (hermeneutics) which are compared and contrasted through a dialectical interchange that involves the "juxtaposition of conflicting ideas, forcing reconsideration of previous positions" (Guba & Lincoln, 1989, p. 90).

Emancipatory Paradigm

The emancipatory paradigm includes critical theorists, Marxists, feminists, ethnic minorities, and persons with disabilities (the active subjects of the research), among others. The emancipatory researchers argue that the constructivist paradigm did change the rules, however, it did not change the nature of the game. According to emancipatory theorists, constructivist researchers still consist of a relatively small group of powerful experts doing work on a larger number of relatively powerless research subjects. In contrast, the emancipatory paradigm directly addresses the politics in research by confronting social oppression at whatever levels it occurs (Oliver, 1992).

The philosophical base of the emancipatory paradigm is quite diverse, reflecting the multiple positions represented in that paradigm. For example, Tong (1989) identified seven different varieties of feminist thought, each with its corresponding philosophical base. A number of ethnic minorities have written that mainstream feminists are not representative of their views (e.g., Collins, 1990; James & Busia, 1993; Stanfield & Dennis, 1993), thus adding to the complexity of identifying "the" philosophical base of the emancipatory paradigm.

Three strands of feminist research identified by Oelsen (1994) provide insight into the major philosophies that underlie the emancipatory paradigm:

(1) **Standpoint theorists** stress that all knowing substantively involves the standpoint or social and historical context of the particular knowers (Alcoff & Potter, 1993). Important standpoint theorists include Harding (1993), Hartsock (1983, 1985), and Dorothy Smith (1987). Harding (1993) described the starting point of standpoint theory as follows: "...in societies stratified by race, ethnicity, class, gender, sexuality, or some other such politics shaping the very structure of a society, the *activities* of those at the top both organize and set limits on what persons who perform such activities can understand about themselves and the world around them" (p. 54). Much, although not all, of standpoint theorists work proceeds from a Marxist orientation, thus examining the researchers' role in the power structure.

(2) **Feminist empiricists** follow the norms of the postpositivist and constructivist paradigms with the caveat that women's lived experiences are central to the research process. Thus, they share the philosophical base of these paradigms, while at the same time borrowing ideas about social justice and oppression from emancipatory theorists.

(3) **Postmodern feminist** thought is rooted in the philosophies of poststructuralism and postmodern thinkers such as the French feminists Cixous, Irigaray, and Kristeva, and Foucalt, Lyotard, and Bandrillard (Sands & Nuccio, 1992; Oelsen, 1994). Textual analysis and the role of text in sustaining the integration of power and oppression has been a central focus of postmodern feminist research.

The emancipatory paradigm (as exemplified by the varieties of feminist thought) is broad and far from a unified body of work. Martusewicz and Reynolds (1994) described the commonality of concern for feminist theories as "understanding and improving the lives and relations between women and men, economically, socially, culturally, and personally" (p. 13). Feminists generally agree that historically women have not enjoyed the same power and privileges as men either in the public or private sphere. Women live their lives in an oppressive society; it is this concept of oppression that links the voices of those who work in the emancipatory paradigm.

Four characteristics are common to the diverse perspectives represented in the emancipatory paradigm and serve to distinguish it from the postpositivist and constructivist paradigms (Mertens, Farley, Madison, & Singleton, 1994). These include:

(1) It places central importance on the lives and experiences of the diverse groups that have traditionally been marginalized (i.e., women, minorities, and persons with disabilities);

(2) It analyzes how and why inequities based on gender, race/ethnicity, and disability are reflected in asymmetric power relationships;

(3) It examines how results of social inquiry ~~on~~ inequities are linked to political and social action; and

(4) It uses an emancipatory theory to develop the program theory and the research approach.

With that lengthy introduction to the emancipatory paradigm, and in full recognition of its diverse and emerging character, the answers to the three "defining" questions are as follows:

Ontology. Like the constructivist paradigm, multiple realities are recognized in the emancipatory paradigm. However, the emancipatory paradigm stresses the influence of social, political, cultural, economic, ethnic, gender, and disability values in the construction of reality. In addition, it emphasizes that that which seems "real", may be reified structures that are taken to be real because of historical situations. Thus, what is taken to be real needs to be critically examined (deconstructed) in terms of its role in perpetuating oppressive social structures and policies.

Epistemology. The relationship between the knower and the would-be known (i.e., the researcher and participants) is viewed as interactive. Harding (1993) recommends that the researcher use a methodology that involves "'starting off thought' from the lives of marginalized people" (p. 56). This would reveal more of the unexamined assumptions influencing science and generate more critical questions.

Feminist objectivity means "situated knowledge" (Haraway, 1991), i.e., recognizing the social and historical influences on that which we say we know. Harding (1993) argues that politically guided research projects have produced less partial and distorted results than those supposedly guided by the goal of value neutrality. Objectivity in this paradigm is achieved by reflectively examining the influence of the values and social position of the researcher on the problems identified as appropriate for research, hypotheses formulated, and key concepts defined.

Methodology. Emancipatory researchers are pluralistic and evolving in their methodologies. The empiricists whose work reflects the quantitative methods traditionally associated with the postpositivist paradigm emphasize a need for more care and rigor in following existing methods to avoid sexist, racist, or other wise biased results (Eichler, 1991; Harding, 1993). Other emancipatory researchers use a wide diversity of methods; many make use of qualitative methods such as interviews, observations, and document review within an emancipatory framework (Reinharz, 1992). Miller and Treitel (1991) compiled an annotated bibliography with 416 references that discuss feminist research methods. A common theme in the methodology is inclusion of diverse voices from the margin.

Merging Paradigms

In practice, many researchers combine the use of quantitative and qualitative methods, and so, on the surface at least, it appears that a merger of paradigms is possible. Reichardt and Rallis (1994) argue that postpositivists and constructivists share more compatibility than incompatibility, and that depictions of paradigms such as that described herein emphasize differences more than similarities. On the other hand, Guba and Lincoln (1994) maintained in their chapter in the *Handbook of Qualitative Research* and in their earlier writings, that the paradigms are basically incompatible (they used the word: incommensurable). However, in an article that was written only months after their chapter in the *Handbook*, they stated that they have begun to have second thoughts (Lincoln & Guba, 1994). They suggest the possibility of developing a new paradigm *in the future* that looks at everything as a matter of degree, rather than dualistically (e.g., something is either real or it is not).

As the field of research has not yet reached this point in its development, this paper presents the existing paradigms and their assumptions as starting points for thought. As researchers, we should be aware of our basic beliefs, view of the world (i.e., our functional paradigm), and the way these influence our approach to research.

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KEEPING DOORS OPEN IN MATHEMATICS/SCIENCE FOR MIDDLE SCHOOL GIRLS

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ABSTRACT

This paper presents a conceptual model of a Murray State University College of Education Special Outreach designed to stimulate the interest in mathematics/science for girls, a group that has historically been under-represented in careers requiring advanced coursework in these areas. The main elements of this program will include mentoring and career advisement to empower girls to make intelligent curricular selections and hands-on "fun" instructional activities. The goal is to enhance female proficiencies in problem solving and critical thinking by the development of skills required to become self-reliant learners/leaders, in an environment of action and accountability.

INTRODUCTION

Our nation is currently waging an economic battle to meet the challenges of a global market, requiring increased scientific and technical literacy. In the coming decade, economic progress, international competitiveness, and growth in living standards will depend largely on technological innovations. At a time when current skills are daily becoming obsolete and new skills are essential, America may face a shortage of workers with technical skills (Appalachia Educational Laboratory, 1991; The Association for Women in Science, 1993). This, to a degree, is the outcome of the failure to maximize the potential of women, who frequently do not enroll in advanced science and mathematics courses. This self-selection out of higher-level courses acts as a 'critical filter' limiting college majors, post-secondary employment, and college admission (Crawley & Coe, 1990; Holmes, 1991; Sells, 1993).

Who will fulfill the urgent American need for employees with scientific, mathematical, and technological competencies when the demand surpasses the supply? We must meet this human resource demand by adding to the ranks of productive and skilled employees. Upgrading the quantity of competent employees demands recognition and utilization of the talents and energies of all capable workers, regardless of gender (Committee on Women in Science and Engineering, 1991; American Association of University Women, 1990; Van Buren, Daines, & Burtner, 1990).

WHAT IS OPEN DOORS?

Keeping Doors Open in Mathematics/Science for Middle School Girls (Open Doors) is the Murray State University College of Education vision to create an increased awareness of careers where advanced coursework in these areas is requisite. Open Doors will be loosely modeled on the well-known Expanding Your Horizons conferences, developed by the nationally acclaimed Math/Science Network based at Mills College (Failor, 1994; Koltnow, 1980). The goal of our pre-college outreach is to utilize the untapped potential of girls by providing gateway experiences into careers requiring advanced science and mathematics preparation (Failor, 1994).

Middle school girls will interact with positive female role models/ mentors, in small cooperative groups or participate in individual dialogues, and begin to understand the importance of an early and adequate science and mathematics foundation. However, the main focus of Open Doors is a variety of role model/mentor-faciliated hands-on learning experiences. This action-oriented atmosphere enhances the opportunities to problem solve, think critically, and become self-reliant learners/leaders (Ryckman & Peckham, 1987).

The distinctive feature of Open Doors is the follow-up. The girls who participate will be allowed to borrow the equipment used during these hands-on learning experiences to conduct workshops in their middle schools. The equipment will include several high-interest pieces, such as lasers, electromagnetism detectors, global positioning systems, and Starlab, a portable planetarium.

The pilot for Open Doors is tentatively scheduled for Fall 1995, and is endorsed by the College of Education, the Murray chapter of AAUW, the Partnership for Reform Initiatives in Science and Mathematics (PRISM; Kentucky's National Science Foundation-funded Statewide Systemic Initiative), the Provost, and Deans in Education and Science.

IMPORTANCE OF OPEN DOORS

There have been a plethora of studies that document the importance of a solid science/mathematics foundation for girls (Holmes, 1991; Hussey, 1987; National Coalition for Women and Girls in Education, 1990; Oskamp & Costanzo, 1993; Peltz, 1990; Ransome & Moulton, 1992; Tobias, 1994; Wright, 1991). Moreover, the Wellesley Center for Research on Women and the American Association of University Women (1992) have identified female adolescence as the stage when science/mathematics enthusiasm declines at a significantly higher rate than their male counterparts.

Therefore, the female adolescent years would be the most advantageous period for our local coalition of educators, citizens, and community leaders to create this program that increases the visibility and attractiveness of careers requiring advanced science and mathematics (Campbell, 1992a; Darling & Sorg, 1993; Failor, 1994; McBride-Bass, 1993). Open Doors is a laudable outreach which nurtures girls' confidence by encouraging them to seek higher technical literacy and empowering them to borrow and demonstrate science equipment to instruct both male and female classmates. These self-reliant learners/leaders, and problem solvers are developing technical, science, and mathematical skills for the twenty-first century.

OBJECTIVES OF OPEN DOORS

The main objectives of Open Doors are to:

- Enhance problem-solving skills, utilizing the scientific inquiry methods

- Develop a support network to enhance science/mathematics course selection
- Initiate a follow-up, involving scientific equipment on loan basis, to schools for girls who participate
- Provide collaborative hands-on learning activities which promote participation and increase learning (Sanders, 1994; The National Coalition of Girls' Schools, 1993).

and

- Develop a prototype with replication potential for other Kentucky regions.

EVALUATION

The effectiveness of the pilot Open Doors conference will be assessed through the post-conference data collection and feedback from the girls. This would allow the conference to be revised and adjustments made for 1996. In addition, a longitudinal study will document the mathematics/science course selections of participants and nonparticipants.

Finally, the prospects of success for Open Doors are excellent because our strategy is to tailor it to meet the needs of our community. We will utilize the talents of Kentucky women and the Murray Chapter of AAUW.

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Toward Tenure:
The Influence of Same Gender Dynamics on Professional Relations & Strategic Choices

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Equity for academic women is contingent on the promise of stable careers and an equal place in the permanent professoriate. Yet, women's advancement into the ranks of the tenured faculty in higher education proceeds at a glacial pace. Although women are increasingly well represented nationally as academicians, they remain clustered in non-tenure track positions, two year institutions, and the lower faculty ranks of prestigious universities[1]. A significant next step toward equity for women faculty, therefore, is the step to tenure and a crucial place to take it in significant numbers is the ranks of the professoriate at doctoral and research institutions. Despite deeply embedded structural impediments to women's advancement in the academic workplace, there are women who have taken the step to tenure. Some have done so under the most adverse of conditions. There is much to be learned from their accomplishments.

This paper reports on an analysis of cases of women who were denied tenure, fought the decisions against them, won, and returned to their jobs. The cases occurred in the 1980s at research and doctoral universities across the country and in a variety of academic disciplines that include the biological, physical, and social sciences, the humanities, and professional schools. Data sources include participant observation, in-depth interviews, court records, and other archival material. The research project employed case study, ethnographic and action-research methods.

I will use observations from these cases to argue that some of the commonly accepted practices for increasing women's participation are unreliable. Then I will discuss two of the practices that developed in the tenure cases which did support women's advancement to tenure. Typical professional development includes formal mentoring, reliance on senior women to advocate for junior colleagues on hiring and tenure committees, and same-gender role modeling. These practices are rife with problems for junior women.

First, using formal mentoring as an example, I will discuss some reasons why commonly accepted practices for advancing women aren't reliable. Mentoring, formal or informal, is often absent for junior women in the most male dominated departments where the need for it is the greatest. One woman who is now in a tenured position at a prestigious institution explained the difficulties she encountered on entering her department.

> I clearly screwed up and was screwed up in terms of entry. In other words, partly my fault, partly the institution's fault. I did not get picked up, included, made comfortable, helped, advised, supported. It just didn't happen. Maybe I didn't seek it right, maybe I didn't accept it right, maybe I was too scared, too opinionated, too ignorant , you know all of those things. ...It's also true that nobody [cared] about helping me, except [one of the senior women], and to some extent it was very hard for [her] to mentor me because of our personal styles....She did more than anybody else. I mean it was a question of nothing or something, but very little was done in general. I mean men get picked up to co-author a text book and recommended to give this speech, [promoted with statements like,] he's-a-top-notch-teacher, as opposed to the well-everybody-thinks-she's-a-good-teacher-she-must-go-easy-on-them. Do you know what I mean? The constant sort of eroding, not only... benign neglect, but also a kind of undermining.

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[1] National Center for Educational Statistics. (1991). 1988 National Survey of Postsecondary Faculty. Washington D.C. (NCES 91-389)

Even when mentoring is present, though, it is not clear that is effective. Formal mentoring is a conscious attempt to mirror informal relations between senior and junior professional men. It does not necessarily take into account the challenges of cross-gender professional relations in the academic work-place. The traditional god-fatherly nature of a professional mentoring relationship might be viable in a context where life-cycle events, habitual practices, and social relations are somewhat homogenous.

One of the roles of a mentor is to help junior colleagues integrate into the social milieu of the department and to escort the junior colleague through the discipline's social circles. Although this may work for junior men, it is complicated by extraneous circumstances when applied in the case of junior women.Consequently, it is not a viable model for many women who are in male dominated fields and departments, particularly in highly competitive, exclusive environments where departmental faculty maintain close knit social and professional communities. Although these are the circumstances in which traditional mentoring between men might work best, they are also the most socially and professionally awkward circumstances for isolated women academics.

Women in this study described experiences of social discomfort or worse at meetings in social settings, like conferences and faculty dinner or lunch parties. They described situations in which, as lone women in groups of academic men, they became the objects of predatory sexual attention, the subjects of sexual suspicion and rumor, or were simply ignored or made to feel either too visible or entirely invisible. For example, one interviewee was mentored and attended regular quasi-social gatherings of men in her subfield along with her mentor. At these semi-social events, she was repeatedly ignored. She reported that scholarly ideas that she expressed in conversation were frequently wrongly identified as the ideas of one of the men around the table.

When a junior women stands in the shadow of a well-established man in the field, it can be difficult for her to get the type of attention that she needs and to refuse the kinds she doesn't. Mentoring can go awry because of gender-based dynamics. For example, in one case a woman's career was jeopardized when she refused to comply with her mentor's request that she distance herself from another junior woman in her department. In another case, a woman became the object of professional scorn after ending a romantic relationship with a powerful mentor. In yet another, a mentor's ambitions for the junior women were far less substantial than her abilities and her own ambitions called for, and her mentor's underestimation of her held her back professionally. Same-gender role modeling and representation by senior women, on hiring and tenure committees for example, also are problematic and often ineffective.[2]

Because common practices didn't work or were destructive to their professional advancement, the women in this study invented entirely new ways to interact as colleagues. These women, through their relationships with each other across ranks, disciplines, departments, institutions and even professions, —in moments of crisis and out of necessity,— developed new forms of professional and collegial relationships. These relationships between women are different from professional relationships established by routine practice in academic departments for the purpose of navigating women through higher educational institutions. Key to these interactions is an emphasis on partnerships between women of the same rank, or relationships with people in other departments, institutions or professions rather than the traditional same-site, hierarchical relationships inherent in role-modeling, representation, and mentoring. These

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[2] Based on observations in this study, I have discussed relations between women across rank more fully in the Proceedings of the Eighth International Conference on Women In Higher Education, 1995.

relationships may serve as useful models for advancing women further, faster, and higher into the more male dominated segments of the academic enterprise.

I will describe two forms of professional relationships observed in these cases that hold promise as models for junior women faculty as they try to advance into the tenured ranks at research and doctoral institutions. First I will explain how junior faculty women formed partnerships that ultimately enabled both women in the partnership to win tenure, (although not without protracted battles,) and then I will give examples of how relationships with people in other departments, institutions, or professions gave women access to information and skills that were crucial to their advancement but that they were unable to acquire from either male or female senior faculty members in their own departments.

Before describing the partnerships women formed, however, it is necessary to briefly explain how historical changes in the circumstances of women's entry into the profession created the necessity and opportunity for the evolution of these partnerships. The first women to enter the professoriate in doctoral and research institutions did so almost entirely in isolation. Historian Geraldine Clifford has accurately described them as "lone voyagers.[3]" The fact that they were good at what they did is a given, but what differentiated them from other women who might have aspired to their success was a combination of sheer determination, fortuitous turns of luck, and the patronage of a few good men who acted as their mentors, sponsors and defenders. During the 1970s, changed views and changed laws resulted in the hiring of junior faculty women in larger numbers, that is occasionally two or three junior women were hired in tenure track positions simultaneously or in close succession to one another. The experiences of women hired during the 1970s, in these matched pairs or trios, —which was the situation for several of the women in this study— appears to vary significantly from the experiences of their predecessors. In some ways this created problems, which I'll explain first and then describe how the women transformed the situations to their own advantage.

One woman in the study explained the problem as a perceived threat that women were becoming too large a fraction of the faculty in the department. She said,

> With [the senior woman] I am sure there was no trouble. There is never any trouble when it is just one or maybe two. And then with [the other junior woman] and me, I think that they saw that there would be a large number of women coming and I just think they couldn't quite swallow it.

Other women encountered similar difficulties. Two of the formidable problems they encountered were their colleagues' assumptions of the women's sameness and the habit of constantly comparing the women to each other. The women found that they were not viewed as distinct and separate but rather, were seen in constant comparison to each other.

A woman interviewed for the study explained this succinctly, "Until you have eight or ten women you don't really have freedom to breath in terms of what kind of a person you are because everybody thinks you should be alike or compares you to each other." Another said,

> Well, the men in my department had a well-established pattern of pitting women against each other and that is what makes it interesting, I think, because I always felt

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[3] Clifford, G.J. (Ed.) (1989). Lone Voyagers: Academic Women in Coeducational Universities 1870-1937. New York: Feminist Press at the City University of New York

> that the case in our department was somewhat different from cases in other departments where a woman would be completely alone. And I feel that it's interesting from that point-of-view because it clearly reflects what's going to be happening in the future as more and more women enter male purviews that certain males will attempt use women against each other and to mark off some women as good women and other women as bad women; and encourage women to be labeled 'good' so that they'll get the perks and the other women the shaft. In any case, that was the technique [used] in the period when [the other junior woman] and I were both hired.

The women were very clearly viewed in relation to each other, and were compared and evaluated relative to each other and not relative to the faculty at large or even to their junior male counterparts. One woman explained the situation with which she and her female colleague had to contend,

> Because I was seen as a kind of double of [a woman who had been there before, they assumed that like her,] I wouldn't publish. They would get a lot of work out of me, I would be good teacher, and then they would get rid of me. The problem was that I did publish. And there was the point. I got [a major publication] out in three years I had other projects down the road. And there was no problem until that third year when my publications appeared. That is when the problems started. Instead of patting me on the back saying, "Isn't this wonderful," they started saying everything they could to keep me from progressing towards tenure. That really set them off. ...I think there was ... a fear that women would be tenured in the department in some sort of critical mass, and that they would therefore have a certain amount of power and influence in the department.

Another woman in a matched pair described the circumstances she and her female colleague encountered,

> Once [the other junior woman] had trouble ... then I knew I was going to have trouble. There was just no doubt that if her work was not going to be viewed as adequate then, [neither was mine.] I mean my work was then evaluated as against hers. And so the feeling was, "If we didn't give [the other junior woman] tenure with two [significant publications,] and it was a closer vote, how can we give tenure to [this woman]?" So once she was perceived as problematic then I knew that I would be, so it was no surprise.

Under the circumstances, and in each case, it was clear that one of the women was viewed as stronger and more likely to be tenured, while the other's fate would rise and fall almost exclusively in relation to the fate of her female partner in the collegial pair. In response, some of the women chose an effective strategy for confronting this treatment. They coordinated their campaigns for tenure, completely conflating their individual interests for their mutual gain. One of the women in such a matched pair explains how tightly bound the two women's battles for tenure became.

> My case wouldn't have come out the way it did without hers and her case could never have been without mine, both in politics, persons, substance. And I think she and I both know that and whatever the rest of the world thinks, we both know that each of us played a central role in each others' case in every meaning of the word, interpersonally, impression-management, political allies, enemies, political-structural developments, leverages each of us had differentially at different points in time, ways in which we could assist the play-off of each others' cases, they're incredibly tightly bound together in the institution's life. I got tenure [within] days after her press

> conference announcing that she had gotten a [finding of a] pattern and practice of gender discrimination, but she was the sole plaintiff in the case formally. You know, they really are tightly nested.

Ultimately, the partnerships enabled women to circumvent some of the problems associated with social and intellectual isolation and also to find emotional, political and practical support to pursue the goal of winning tenure. For the women whose tenure was in jeopardy and who won tenure, the benefits of the partnerships were self-evident. For the women whose positions on the faculty were more secure, the partnerships provided an opportunity to reconcile their identities as scholars and their gender-identities. One woman commented,

> I would not have stood up for somebody that I didn't believe deserved [tenure]. But given that I knew she deserved it, how could I do otherwise? To do so would be to betray myself as a scholar and as a feminist. What would I have left then? I can't even imagine. Though I can look at some of my colleagues and I have a pretty good idea (laughs).

The ramifications of these partnerships in departments where both women eventually won positions on the permanent faculty extend beyond the collegial pairs. The women in the study all spoke of the fundamental changes in gender dynamics created by their unyielding refusal to be compared and leveraged against each other. One commented,

> The series of women —and non-white and also male cases— from my point onward in the institution are all effected by their-- it's like birth-order in a family, for good or evil, for strength or not... I'm not saying they are effected in the sense that they would have come out differently, [but] they are all effected in the rebound position.

In addition to forming partnerships with junior faculty women in their own departments, women formed important relationships with women in other departments, institutions and professions. Sometimes in addition to, but mostly without viable mentoring, reliable role-modeling, and effective representation in their own departments, women sought advise, assistance, and outright advocacy from both women and men in departments other than their own or from scholars in their disciplines at different institutions. In so doing, they transgressed the professional imperative of local collegial control, but in their search for fair evaluation and treatment they acted and called on others to act with integrity and dedication to the highest principles of a meritocracy. Their calls, generally, were answered. Although responsibility for the fight legally, financially, professionally and personally, ultimately rested with the women who fought to regain their posts, each described with the kind of appreciation expressed below, the tremendous support that they received from academic women men at their own institutions and across the country: "I mean other women did this, I did not do it, OK. Other women did it. I mean, I lead it, I lead; but by myself I would have done nothing. They did it."

Women interviewed for the study spoke of the crucial involvement of a large network of both academic and non-academic women, involvement that ranged from help with mundane tasks to contributions of professional expertise.

> Within hours of my getting this phone call from my chair that devastated me—how could he have done this!— and calling one or two colleagues, a law professor who I had never met before called me and said, "I am here. I am taking this on. This is not right. I know all about you and this is not right." [She's] a wonderful person and she was there through the whole thing giving me free legal advice, driving to the city to go to the lawyer to me, reading everything that I wrote, behind the scenes, everything.

> [She was] the first tenured woman in [our] law school. ...Somebody else said to me, a psychologist said, " I am going to be on call twenty four hours a day.... A person has to know, you have to know if you ever need to talk to you can call me any time of day. That is my role in this."...Just knowing that somebody said that you never have to feel totally isolated.

Outsiders' also were vital to the process of breaking through the exclusivity and insularity of departmental culture to assert the value of the woman and her work to the discipline and the profession. The assistance of these individuals was indispensable to the women who fought to retain and regain their jobs. For example, one woman, faced by a hostile department chair, used the following approach to prepare an unbiased tenure dossier,

> I was concerned at the time which I went up for tenure, that my student evaluations would not be fairly summarized by the department. I had a woman department head do that for me. She did a summary, [it was] unprecedented but we did it anyway so that I would get a summary ...that I would know is not biased and that other people wouldn't think is biased. She was a respected person.

Later, this summary was used as evidence in a legal proceeding in her case. Another woman's legal settlement authorized a second review of her case for tenure. She and the university had to agree on the panel of reviewers. To identify faculty for this panel, she turned for help to women colleagues at other institutions and received this response.

> The overwhelming reaction was: I want to help. And it was not talk about their colleagues, but judge their colleagues [in terms of] who would be fair, who would be respectful of women's work, who would understand it. So they were giving me their personal opinions of their colleagues and the overwhelming reaction that I had was how willing they were to help, to an unknown person. Sometimes I knew them, sometimes I knew someone who knew them and said, "Well so-and-so suggested I call you," or whatever, but overwhelmingly it was like a women's network, you know, "Someone needs help, this is going to be confidential." They trusted me. They didn't tell me everything they thought, but you know, they took it seriously that a woman could be discriminated against, got this wonderful settlement and needed help in picking you know, an unbiased panel. And I had no reason to think I would get so much help.

Those who advocated in these cases often did so at their peril. Several were threatened with lawsuits, treated as pariahs in their departments or on their campuses, lost research funding, had damaging rumors spread about them through their professional circles, or even were physically threatened. Nevertheless, they remained steadfastly involved. The persistent power of these informal connections is expressed in the following quote by an academic woman who played a central role in one of these cases,

> ...Everybody was great and everybody did what they were supposed to do. ... Do you know often that happens? I mean [the affirmative action officer] stood up and [the chair of the grievance committee] stood up and [the chair of thefaculty committee] stood up and [the advisor to the president] stood up. And there were people when I needed papers I would go to and ask for papers and they would say, "What are you doing trying to get me fired?" And I would say, "I wouldn't think of it." I am talking about secretaries. And that is impressive. But the way I figure this one, [it's] an enormous up front cause for a lifetime of blessings. I know a lot of people on this campus, all over the campus, in a way that is really important to me. It is not like, "Oh hi how are you?" It is not even, "Lets be on a committee." It is like you know, we have done this together and it is really important.

Twenty-two Years After Legislating Equity
(Title IX of the Education Amendments)
Education and Athletics/Sport Continue to Shortchange Women and Girls

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Introduction

The 1992 AAUW report, "How Schools Shortchange Girls" challenged "...the common assumption that girls and boys are treated equally in...public schools" (AAUW Executive Summary, 1992). This report showed that despite federal legislation (Title IX of the Education Amendments) prohibiting "...discrimination in educational institutions receiving federal funds...girls are not receiving the same quality, or even quantity, of education as their brothers" (AAUW Executive Summary, 1992).

The purpose of this paper and project was: (1) To briefly explore the role of athletics and sport participation as an important part of the educational process; (2) To draw attention to the issue of interest and abilities relative to gender equity and Title IX compliance; and (3) To enhance the meaningful applicability of Title IX compliance and gender equity by conducting a survey to assess where some local schools stand relative to gender equity as determined by the Title IX compliance criteria of proportionality.

Gender Bias...The Evidence...

Historically there have been three major reasons why women and girls have not had equal sport opportunities to those of men and boys. These are: (1) physiological differences between the sexes ("The longest race allowed for women in the 1972 Olympics was the 1500 meter, a hold over from the belief that females could not physically or mentally cope with the competitive demand of longer events" (Weiss & Glenn, 1992, p. 139)); (2) societal norms and attitudes; and (3) organizational rules and support (Lumpkin, 1984). However, continuing research has provided evidence that: (1) there are no medical reasons to justify restricting competition for females based on potential physical and/or psychological harm; (2) cultural attitudes are changing (albeit slowly) relative to women and girls in sport; and (3) although historically females have gotten the short end of the stick regarding athletic opportunities, equipment, facilities and budgets, Title IX legislation and ongoing litigation are beginning to force more equitable allocations (Lumpkin, 1984).

In addition to tangible gender constraints, women and girls continue to be shortchanged by way of sport socialization. Socialization as defined by Weiss and Glenn (1992) is, "...the process whereby individuals learn the skills, values, norms and behaviors enabling them to function competently in many different social roles within their group or culture" (p. 140). They go on to say that the "...socialization of girls into competitive sport roles is influenced by three interacting factors" (p. 140). These factors are: modeling and reinforcement by significant others, available opportunities, and personal attributes.

Regarding significant others and modeling, research shows "...a positive relationship between female self-confidence [and self-esteem] and participation in physical activity..." (Lirgg, 1992, p. 164-165). In reference to available opportunities and personal attributes, Weiss and Glen (1992) suggest that "...performance differences often observed between males and females in sport settings may be a function of experience and practice advantages enjoyed by males because of their earlier introduction into sport, encouragement to become actively involved, and the importance communicated by significant others of being a good athlete" (p. 148). Boys are encouraged and coached to engage and succeed in sport, while girls are often not only not encouraged and coached to be athletically successful, but must overcome societies', "...lower expectations of women in sport activities..." (Weiller & Higgs, 1989, p. 65), as well as the stereotypes that haunt them regarding the incompatibility of traditional female roles and femininity, with success in sport .

Although more could be reported, I believe the evidence presented shows that the benefits of sport participation reach beyond mere physical performance of a particular activity, and that women and girls historically have not, and do not, receive the same sport participation opportunities as men and boys. With this in mind, it becomes clear that as issues of gender equity in sport are addressed, two key questions need to be considered. They are: (1) Why do females participate in athletics and/or play sports? and (2) What are the characteristics of sport paradigms that best meet the interests, abilities and needs of female athletes?

According to Chambers (1991) youth play sports for fun, skill development, excitement and challenge, achievement and status, fitness and health, energy and tension release, and friendship (p. 414). Of these seven reasons, Chambers found males valued achievement and status the most, while females valued fun and friendship. Butcher and Hall (1983), conducted a five year longitudinal survey study beginning in May 1978 to assess the physical activity of adolescent girls. On the basis of their findings three major factors explain physical activity involvement for girls. These factors are: personal attributes, social agents/significant others and social situations, i.e.. opportunities.

Research by Franklin (1993) reveals that, "...between the ages of twelve and seventeen years, about 80% of all children who are enrolled drop out of organized sports programs...and the primary reason for quitting was an over emphasis on winning" (p. 10). This is not to say that Franklin found winning and losing were not important, but that "...what happened to get those results..." was ultimately more important (p. 22). Similarly, Greendorfer (1987), found "...too much emphasis on winning...not enough playing time...and lack of fun..." (p. 62), to be the primary reasons cited by youths for voluntarily leaving sports. Lirgg and Feltz (1989) follow up this line of thinking by stating that especially for women and girls: "Reassurance that effort is more important than winning or losing may help the athlete relax, improve performance, and increase self-confidence" (p. 53).

Based on the above it seems that females and males preferentially operate within different athletic paradigms or models, and that these paradigms/models are based upon different grounding socio-cultural assumptions. Unfortunately (for women/girls), "...women's sport has increasingly been defined and shaped by men's values, men's understandings of the world, and men's experiences -- all of which suppress the development and expression of female values" (Blinde, 1989, p. 37). All too often the programs in which female athletes participate are "...direct copies of male programs and thus incapable of addressing the obstacles [or double bind] of being female and being an athlete" (Franklin, 1993, p. 7). The result for women and girls is increased value alienation, role strain, and role conflict (Hill, 1993, p. 52).

In a discussion of proposed factors affecting female sport participation, Franklin (1993) says that male defined sport programs through their celebration of male values, oppress the development and expression of values, "...more compatible with the experience of females..." (p. 8). Based on this she suggests, "...women's alienation in sport may be a function of both the celebration of male values and the suppression of values consistent with women's experiences" (p. 8). She goes on to propose that athletics drop the male dominated patriarchal model, because it lacks authentic meaning for women's lives, and advocates a redefinition of sport that is inclusive of female values.

Title IX of the Education Amendments

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. -United States Congress, June 23, 1972

Pre-Title IX there were two gender specific models of sport. The male model emphasized strength, power, competition and survival of the fittest. The ideal of the elite athlete was promoted and rewarded and the dream of a professional sports career established. Sports contests were public and the, "...opponent was the enemy, and the winner dominated the loser" (Hill, 1993, p. 50). The female model emphasized enjoyment, health, recreation and social forms of competition. The roots of this model were grounded in physical education and, "...promoted participation for all regardless of ability" (Hill, 1993, p. 51).

In 1972, Title IX of the education amendments was legislated, and mandated that "...institutions could not discriminate on the basis of gender, in any program receiving federal funds, including athletics" (Hill, 1993, p. 51). However, "...rather than ringing the bell for equality...this legislation began an era of merger and acquisition" (Hill, 1993, p. 51), and like any merger, the principles and values of the aquiree (women's sports) were assimilated into the existing values of the aquirer (men's sports). "Instead of adopting a hybrid approach to the acquisition of women's sports, which would have acknowledged the roots of both men's and women's sport cultures and endeavored to build a new culture reflecting the strong points of both traditions, women's sport was assimilated into the existing dominant male model" (Hill, 1993, p. 51).

Since the passage of Title IX the percentage of women participating in athletics has increased considerably. However, even though women and girls represent approximately half of all school enrollment, male sport participation still dramatically outnumbers that of females, and over 70% of the school districts polled, "..did not provide girls with athletic opportunities comparable to those available to boys" (AAUW, 1990, p. 52). In fact of 25 rural school districts surveyed, in 21 states: "...37% of district administrators saw no Title IX compliance issues in their districts...[and expressed views that]...it was stupid or frivolous to worry about equal opportunities for girls and boys" (AAUW, 1990, p. 16).

At the post-secondary level, according to Susan Faludi, (cited in Hill, 1993), although over 50% of college students are female: (1) only about 30% of college athletes are women, (2) women receive only 33% of college scholarship dollars and less than 20% of athletic department budgets, (3) the ranks of women college coaches have declined from 90% in 1972 to less than 50% in 1991, and (4) female coaches are paid significantly less than 99% of their male counterparts (p. 49-50). Clearly findings such as these indicate that: "...sex and gender equity issues are still not well understood by many educators, (p. 16); and the unfortunate reality is that "...twenty years after the passage of Title IX, the achievement of sex and gender equitable education remains an elusive dream" (p. 89).

Project Introduction

In an attempt to contextualize and bring issues of gender bias and gender equity in education and sport into focus, a Title IX compliance survey was developed as a follow-up to the text of this paper. The purpose of this survey was to raise educator awareness regarding gender equity and Title IX compliance in athletics (by virtue of reading the survey introductory "info-letter" and attempting to survey their institutions); and assess where some local schools stand relative to Title IX compliance as determined by athletic participation proportionality. Title IX compliance in athletics is assessed based on three main categories. These are: (1) the accommodation of interest and abilities relative to "substantially proportionate" (Vargyas, 1994, p. 17) athletic participation opportunities; (2) athletic financial assistance; and (3) equitable benefits and opportunities relative to equipment and supplies, scheduling of games and practices, travel and per diem allowances, tutoring, coaching, locker rooms, practice and competition facilities, medical and training facilities, housing and dining facilities, publicity, recruitment of student/athletes and support services (NAGWS, 1992 and Vargyas, 1994).

Methods

For the purpose of this project a Title IX "info-letter" that briefly outlined the basics of Title IX compliance, its legislative history, and ongoing legal evolution, along with a compliance assessment survey were developed. The survey instrument is attached (see Appendix A). Survey data were collected from a limited sample of convenience, with institutions surveyed based on their relationship/affiliation with Portland State University CI 641/510, and EPFA 651 class members. "Info-letters" and surveys were distributed to approximately 20 class members, and eleven surveys were returned (although some with only partial information). This resulted in a 55% return rate. Institutions ranged from elementary schools to middle schools, junior highs, high schools and colleges (NAIA and NCAA).

Limitations

It is important to keep in mind the purpose of this project/survey and to recognize that it was not designed and conducted to yield comprehensive and/or generalizable results. The results are based on a small sample (N=11), and the survey instrument lacked sufficient specificity to elicit consistent enrollment and sport participation data. Were this project/survey to be reconducted and/or expanded, considerable attention would need to be devoted to clarifying the methodology with regard to both sampling and instrumentation.

Findings

Despite its limitations I believe this project did fulfill its stated purposes, i.e.: (1) By virtue of reading the survey "info-letter" 20 educators became better informed about what Title IX is and how it applies to athletics and sport; and (2) The survey results support the literature cited in this paper, and provide data that show, even in our own back yard, Title IX compliance as determined by proportionality is not a reality, and athletics/sport continues to short change women and girls.

Specifically, the survey data showed that although enrollment percentages were close to 50/50 (females/males), with ranges of 48%-59% for females and 40%-52% for males, the athletic participation percentages were not proportional to these enrollment percentages. Females had less athletic participation opportunities than males, and less than their enrollment proportions might predict. The overall mean female participant percentage was 39.33%, while the overall mean enrollment percentage was 52.57%, and the overall mean male participant percentage was 60.67%, while the overall enrollment percentage was 47.43%.

In addition to overall enrollment and athletic participation means, high school and college means were also calculated. As with the overall means, although the mean enrollment percentages were approximately 50/50 (high school enrollment means: $\bar{X}$female=49.75 and $\bar{X}$male=50.25, college enrollment means: $\bar{X}$female=56.66 and $\bar{X}$male=43.34), athletic participant opportunities were not proportional to enrollment, i.e. females at both the high school and college levels had less participant opportunities than their enrollment percentages might predict and/or indicate, (high school participation means $\bar{X}$female=44.4 and $\bar{X}$male=55.5, college participation means: $\bar{X}$female=34.25 and $\bar{X}$male=65.75).

None of the schools surveyed conduct any formal assessments and/or surveys to determine if the interests and abilities of the under-represented sex, in this case females, were being met by the existing athletic opportunities.

Additionally, it may be important to note that the high school athletic participation numbers were considerably greater than college participation numbers (mean high school participation numbers females=258, males=327; mean college participation numbers females=85.5, males=180.25), and that high schools offered a much broader range of sport options to both females and males than those offered by college athletic programs (mean number of high school sports offered for females=9.5, males=10.25, mean number of college sports offered for females=6, males=6.2). This could be an especially important area for further research and/or discussion, as college athletic administrations frequently cite recruit viability, as a reflection of interest and ability, as an impediment to expanding female sport opportunities.

Concluding Thoughts & Recommendations

This paper has presented a review of some of the literature on gender bias in education and sport. The role of sport as an important part of the educational process has been highlighted, and issues of gender equity relative to Title IX compliance have been raised. I believe the information and evidence presented in this paper and the project survey data, do serve to raise educator awareness regarding the prevalence and persistence of gender bias in education and sport. Additionally, I believe athletics and/or sport have been shown to be a powerful medium for youth to experience implicit and explicit life-skill development and socio-cultural education. Viewed from this lens it is essential for educators to become increasingly aware of gender bias and actively pursue and promote gender equity in both education and athletics/sport.

To proactively pursue and promote gender equity in athletics/sport, and increase and enhance the interests and abilities of women and girls, I recommend that: (1) educational institutions of all levels actively recruit and/or train female coaches and athletic administrators. Research shows, "...children imitate same sex [models] more than opposite sex [models]" (Mancus, 1992, p. 111); (2) media attention become more equitably focused and representative of both genders. Research on media coverage content and quality, "...suggests that media have served to perpetuate gender stereotyping rather than promote women in sport and physical activity...via under representation and trivialization..." (Weiss & Glenn, 1992, p. 141); and (3) in order for women and girls to be authentically encouraged to participate in physical activity, and athletics/sports, the traditional male dominated athletic model must be abandoned; and in its place athletics/sport must espouse an inclusive egalitarian model that accommodates the values, traditions, and cultures of both women and girls and men and boys.

I believe to continue to accept and propagate inequality simply because females and males do not demonstrate an equal interest and/or ability to participate and succeed in a traditionally gender-specific, male dominated model, is a gender bias that must no longer be tolerated.

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Appendix A
Title IX Compliance Assessment Survey

School: ______________________________ Grades: ____________________
Survey Information Source(s): ____

Overall Student Enrollment (#): __________
Female Student Enrollment (#): __________
Male Student Enrollment (#): __________

Sport Programs Offered & Participant Numbers:

Female Sports & participant #'s	Male Sports & participant #'s

Does your school survey women/girls regarding their interests and abilities relative to sport participation? **yes/no**

If yes please attach a copy of the survey you use.

Teaching Gender Equity as a Social Skill in the Elementary Classroom:

Primary Prevention of Sexual Harassment Through New Awareness and Skills

by Katia Stavrou Petersen MA, ARGO and Associates

Introduction

This paper contains four main sections. In section one preventing sexual harassment in elementary grades will be examined in the context of prevention and teaching prosocial skills. Section two contains a brief explication of sexual harassment in school settings. Section three describes the implementation of sexual harassment prevention instruction. Finally, section four contains observations from the field.

Section One: Prevention and Prosocial Skills

In this paper elementary instruction to prevent sexual harassment is discussed as an important curriculum element to be included in classroom methods teachers use to create safer school environments for girls and boys. Developing respect for gender and healthy sexuality are considered here as prosocial skills that are necessary for successful relationships. Tools are being developed to assist educators specifically with preventing sexual harassment in the elementary grades; however, they need to be used with other prevention and social skills materials because many behavioral issues are related. Defining sexual harassment concepts and preventative skills can be efficacious and welcome, but it is more so when considered in the context of broader prosocial outcomes.

Teaching prosocial skills for successful living requires a paradigm shift away from restricting the mission of schools to academic learning. Children spend a great deal of time at school, and so it is a natural environment for them to learn new, positive behaviors and attitudes. We must expand our curriculum plans to help place our students in a receptive frame of mind to learn. Safety for a child pertains not only to a controlled environment, but to a perception that the school is a warm, nurturing place, where she or he will be treated with fairness, equality, and mutual respect.

Prosocial skills are learning experiences designed to enhance children's well-being by supporting positive self-identity and behaviors such as peaceful conflict resolution, understanding and celebrating diversity, having a sense of equality and respect, critical thinking/listening/watching, positive self-esteem, personal safety, healthy sexuality and identification, and appropriate expression of feelings.

It is increasingly understood that prevention education focused on prosocial social skills needs to be an integral part of the regular classroom curriculum (Petersen and Petersen). Cultural attitudes toward gender, family, community, religion, and many other facets of life need to be taken into account when planning the curriculum so that a more direct connection can be made between what goes on at school and what happens in students' lives outside school (Romano). When our school programs are sensitive to the realities children face -- gender relationships, conflict and violence, inclusion and respect -- we

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are offering them information that is more pertinent, motivational and helpful for them to make healthy choices.

When teaching sexual harassment concepts to elementary-age boys and girls it is important to keep from shaming and blaming. They are only reflecting that which they have learned from those around them. A member of the primary grades may use sexually offensive language and actions as expressions of aggression with little specific understanding of how gender-based harassment can be used to exercise power over another child. Our efforts to stop the perpetrating child from doing this may not yield the results we seek if our methods are restricted to explaining sexual harassment concepts separate from the larger context of positive social behavior. Further, we are more likely to create misunderstandings and tension with parents and community if we do not give young children assistance to understand their behavior in a larger context, but instead focus only on sexual harassment.

Section 2: Sexual Harassment in School Settings

It is generally accepted that unwelcome conduct directed toward an employee or student because of his or her gender may constitute sexual harassment. This includes sexual touch, sexually oriented comments, and forceful acts of coercion.

In an educational setting, sexual harassment may result from words or conduct of a sexual nature communicated in a manner that would, under the circumstances, offend, stigmatize, or demean the student against whom the harassment is directed.

The Teacher's Role

As much as we would like to believe that all our children come from nurturing, supportive and stress-free homes, we know that this is not necessarily true. We cannot assume that the children we face every day in our classrooms have the skills necessary to survive in this world. Sadly enough, most children are told what they have done wrong rather than how special they are. Oftentimes they are surrounded by sadness, violence and disapproval, rather than support and empowerment.

Although we recognize how busy educators' schedules are, we also need to understand that we cannot afford to keep from building our students' well-being. Part of being proactive is to promote that all students can learn at all times if we begin to work with their strengths and help them expand their potential and capabilities. Can we really separate the educational needs of children from their emotional needs? When a child says "I am hurting inside", whether verbally or behaviorally, without our support and understanding they will not be able to focus on their learning, not because they don't want to, but because they are under stress.

One of the most powerful things we can do is invite our students to share their feelings and recognize their strengths and uniqueness. If they learn to believe in themselves and are surrounded by supportive adults and a nurturing environment, they have a better chance to develop the resiliency they need to succeed in the face of difficult challenges.

What do we teach?
We can tell children all we want about what sexual harassment means and what to do about it, but without building a strong foundation they will not be able to internalize and use the new information. When they learn to respect, solve problems, understand sexual stereotypes and express themselves appropriately, then they will be able to make healthy choices regarding their well-being and that of others. The follow is a list of skills we have called life-skills, social skills or prosocial skills for successful social interaction and enculturation regarding sexual harassment:

- respect
- dignity and self control
- problem solving
- decision making
- positive conflict resolution
- appropriate expression of feelings
- sexual stereotypes
- good touch/bad touch, good talk/bad talk
- personal safety

Section 3: Implementing Prevention Instruction

Some of the strongest and well thought-out programs fail because there is no support from administration, parents or community. If we truly want to see a change, we need on-going moral support and willingness to prioritize teaching prosocial skills throughout the school year.

Prevention and intervention strategies:

Here is a list of positive essential components to improve school climate and support effective prevention and intervention strategies:

1.) Use lessons that teach real life skills often, as a prevention strategy. Infuse this curriculum into existing subject areas.

2.) Refuse to use Band-Aids on existing problems of physical, sexual and emotional violence, chemical abuse, early pregnancy, gangs, etc., and work toward something more permanent.

3.) Believe in the power of educators, children, families and communities working as partners and find more direct ways to connect these parties.

4.) Work toward a common vision for your school building that defines how you would like to see the educational system change and address problems.

5.) Focus on our resiliency and strengths rather than our limitations.

6.) Teach students to celebrate diversity so that they may learn to embrace other cultures.

7.) Create a strong support system by organizing a team of your like-minded peers. Proceed by collaborating with existing programs and services.

8.) Provide staff development trainings to build new skills and awareness.

9.) Add up-to-date material to your library for both staff and students.

10.) Bring on-going consultation and opportunities for self-care to all staff.

Section 4: Observations From the Field

Teaching sexual harassment prevention to young children requires care and sensitivity. We also need to build the foundation of the lessons not simply on the definition and understanding of sexual harassment but on the premise that without teaching respect, equality and dignity, we will not succeed in preventing or ending the broader issue of harassment.

Entering a classroom with the three puppets for K-3 lessons was always a delight because the children anticipated a positive, fun and yet informative class period. They remembered definitions and were able to share and discuss tough issues on sexual harassment because they felt safe and because the information was given to them in a very entertaining way. Older students created short skits or role played a situation given to them by me. On both occasions, myself or another adult was always involved to take on the role of the receiver of harassment. This way we avoided putting a child on the spot or allowing a child to be inappropriate or hurtful toward a classmate just because of a play.

Situations were chosen from real life incidences, given to me by children, teachers, principals, social workers, et al. Names and events were changed enough to protect children's privacy. Real-life examples give us the most powerful material to use as teachable moments. Children related to the situations and had ideas of how to resolve the issues and were able to realize they are not alone.

Consistent concerns children had and continue to have are:
- My school is not a safe place.
- I don't ask for help from an adult because I will get in worse trouble from the person who is harassing me.

I don't ask for help from adults because:

- they are not there when I need them.
- they tell me to fix it myself.
- they don't know how to stop it.
- I can handle it myself.
- I am too embarrassed.

In order to successfully support the children, they need to know that their school environment is safe and that the adults around them will do everything possible to create a secure and caring environment. Policies and procedures regarding sexual harassment need to be explained to children in simple terms they can understand. Once that is done appropriate action must be taken immediately when harassment takes place so students know indeed there is a support system in place.

Prior to filing reports and handing out consequences children need to be taught the skills necessary to help them understand why sexual, physical or emotional harassment is not okay. We did not see any real success teaching the curriculum until we began to teach assertiveness skills, anger management, dealing with bullying behavior, decision making, healthy choices, inclusion and peer support. Telling children to stand up for themselves, writing letters or verbally confronting the harasser is not a simple or easy task. We need to empower them in a positive way by giving them the right language and the appropriate responses to deal with harassment situations.

Conflict is part of their children's daily lives, and harassment may be a big part of daily conflicts. It is therefore essential to teach children conflict resolution. This does not mean, though, that once we teach children the necessary skills, our job is over. Our active involvement and continued participation is needed at all times. Children need to know they do not have to face any type of harassment alone, but that adults will help them.

To summarize, here is a brief summary of what I have observed is necessary to deliver gender equity instruction successfully:

1. We cannot simply teach kids what sexual harassment is and to say no to it.

2. We did not see success with sexual harassment training until we began teaching skills regarding: assertiveness skills, anger management, making healthy decisions/choices, listening, importance of inclusion, peer support, dealing with bullying behavior.

3. The use of follow-up activities used by the teachers is a key factor to the success of the program to provide consistency and reinforcement through repetition.

4. Teacher training must not focus only on the legal aspects of sexual harassment. Doing so instills fear into teachers and offers no tools and strategies to actually teach the prevention of the problem. Teachers must be represented in the training staff. To exclude the teaching process from a sexual harassment training is one of the most counterproductive steps in trying to set up a teacher-based prevention education

program to address sexual harassment. The teaching staff is a natural group to convey prevention information across a school and throughout a district in all classrooms; however, to mobilize the teachers both background information as well as instructional tools and methods must be provided -- not just a presentation of legal liabilities.

5. If the curriculum is based upon the approach of treating others the way we want to be treated, then the children can learn and understand the information.

6. Nothing will change unless the expectation is that there is a zero tolerance for sexual harassment with real follow-through. Children who follow adult advice to report a problem must have support or the problem may get worse. This is one of the most compelling reasons for school-wide organization around this issue.

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Opening the Window of Opportunity for High School Females

by

Margaret Phelps and Beverly Heath
Tennessee Technological University

The window of opportunity for academically talented young women in the Upper Cumberland region of Tennessee is higher education. The region is rural, isolated from urban centers, and noted for lakes, scenic hills, and a relaxed lifestyle. The natural beauty of the region sometimes obscures the poverty, limited education, and cultural isolation of the populace. In 1990, only 54.5% of the adults in the region were high school graduates; the per capita income was $9,829; and 18.6% of individuals were impoverished. Students have limited access to cultural resources and few educated role models. That is particularly true for females and minorities since most secondary science and mathematics teachers are white males. Females are often discouraged from taking difficult courses in science and mathematics.

The Southern Appalachian culture favors male dominance and traditional gender roles. Status attainment is sought for males while females are encouraged to become full-time homemakers or minimum wage laborers while assuming primary responsibility for care of children and the elderly. High school females establish marriage and family as their life goals and assume that a man will take care of their needs. Young people of both genders either accept lower-paying local jobs or move away from their communities. Tennessee Technological University (TTU)'s Cumberland Career Equity Center's mission is to encourage the young adults of the Upper Cumberland, particularly females and minorities, to consider college-based careers such as engineering, the sciences, and business management. The Center's Career Exploration Camp for High School Females (Career Camp) strives to keep at-risk/disadvantaged and minority females in school and encourages them to continue formal education consistent with their career goals. The objectives of the Career Camp are that each participant will: 1) Gain academic knowledge and skills which will help her be more successful in high school and college or vocational school; 2) Consider a wide range of post-secondary educational and career choices based on personal experiences; 3) Understand that the decisions that a female makes each day have life-long implications; 4) Develop a network of friends and acquaintances beyond her local peer group; 5) Gain confidence in herself to set goals, make choices, and overcome obstacles; 6) Successfully complete high school and enter a post-secondary educational program; and 7) Locate adequate financial support for college attendance.

Career Camp Format

Summer Camp. Summer Career Camp is one-week, on-campus residential experience. The girls live in a dormitory, eat most of their meals in the student cafeteria, and attend classes taught by University faculty across campus. On Sunday afternoon registration and health forms are checked, rooms are assigned, and get-acquainted activities are conducted by the counselors. An informal pizza supper is served in the lobby before the first evening class introducing the week's research project.

Four of the next five days are spent in classes which begin at 8:00am and often extend until 8:00pm except for meals and supervised recreation. Class work includes chemistry laboratory, biology dissections, physics (or engineering or earth science) laboratory, mathematics, computer writing, library research, and one afternoon of arts instruction. On Thursday the girls load on to vans early in the morning for an all-day field trip. In the past few years, some of the field trip sites have included Oak Ridge National Laboratory and Museum, Museum of Appalachia, Meharry Medical College, Tennessee Aquarium in Chattanooga, Kentucky cave sites, Fall Creek Falls State Park, a Tennessee Walking Horse breeding farm, and the Space Institute at Huntsville, Alabama.

On Monday evening the girls, counselors, instructors, and invited guests have a cook-out and evening of recreation at the home of one of the directors. The feature of the evening is a role model presentation by a successful female who shares her personal and professional life story with the girls. Role models have included a nurse who is city mayor, a high school math teacher turned insurance agent, a physician, a Ph.D. research chemist, and a University chemistry professor.

Friday evening the girls attend a play at the Cumberland County Playhouse. This is a favorite activity--particularly since many of the girls have never seen a professional production before. Three favorite plays of recent years have been "I Do, I Do," "Anne of Green Gables," and "It's a Wonderful Life." Since the playhouse is an hour's drive from campus, the group dines at McDonalds. Saturday morning the girls pack their bags, clean their rooms, return their keys, complete the camp evaluation, and depart for home.

Fall and Spring Weekend Career Camps

The weekend camps begin on campus with check-in, pizza supper, and a role model session. The girls and their luggage are loaded on vans for transport to a nearby state park. Girls and counselors are assigned to cabins and then assemble in the larger cabin for get-acquainted activities and games.

Saturday morning finds the girls at a local high school ready for chemistry and physics classes. After a quick lunch at McDonalds, the girls return to the high school for a personal development session. Recent topics have included goal setting, decision making, sexual harassment and teen pregnancy. It is then back to the park for recreation, dinner, and the evening session which is frequently arts/crafts.

Sunday morning the girls pack, clean the cabins, and load back on the vans to return to the University. Sunday morning classes include mathematics and word-processing, editing, and printing of the weekend's writing assignment. After lunch in the University cafeteria and completing the camp evaluation, it is time to leave.

If there is a special campus event, the weekend schedule may be re-arranged to allow unusual activities. Some of those have included attending a literature conference where they met the author of a book they had read, a University basketball or football game, an outdoor ecology class, and martial arts instruction.

Between camps, the staff maintains contact through newsletters, informal contacts with teachers, birthday cards, and telephone calls. Girls who have graduated and who are at TTU frequently come by the Center to chat. The staff takes them to lunch once each semester.

Follow-up of Graduates

Follow-up questionnaires were recently sent to 103 female high school graduates who participated in the Career Camp Program since it began in 1988. Of the 49 (48%) who responded, 96% were enrolled in or had graduated from a post-secondary program.

POST-SECONDARY SCHOOLS ATTENDED BY GRADUATES		MAJOR FIELDS OF STUDY OF GRADUATES	
Tennessee Tech University	55%	Math/Science/ Medical/Engineering	54%
Other Tennessee Public Universities	20%	Humanities	22%
Private Universities	12%	Social Sciences	12%
Community Colleges	8%	Education	8%
Technology Centers	4%	Undecided	2%

A typical Career Camp serves 25-30 high school girls from a 20 county area. Participants are nominated by teachers or counselors on the basis of need and academic promise. Need factors may include income, family stability, family attitudes, or personal characteristics which discourage the student from attending college. Once admitted, they may remain until high school graduation. Most are from homes with limited resources where neither parent attended college and live in isolated rural communities or in urban areas. An effort is made to include students from minorities or with physical disabilities. Using pseudonyms, we wish to share some of their stories.

AMY

Amy, the youngest of three daughters of a Korean mother and an American father, was recommended by the principal of the middle school in a poor, rural county. Her parents were beginning to have marital problems which were affecting Amy. While younger than the other camp members, Amy was an accepted and contributing participant. When Amy was a sophomore, her parents separated and she and her mother moved to Cookeville--from a rural high school with 400 students in four grades to a city high school with 1200 students in three grades. Already knowing some girls at the new school from Career Camp and having had the academic experiences of camp helped her to make the transition smoothly. By her junior year Amy was an established leader in Career Camp, taking responsibility for helping new girls feel comfortable and encouraging her peers to stay on task in class. Her school selected her for several honors including Girls State and the Governor's School in International Studies. By her senior year, Amy was contending for top academic honors in the senior class while helping support her mother financially and emotionally. The strain of this load and her self-imposed academic competition led to an emotional and school crisis just before Christmas. With assistance and advice from the Career Equity staff consulting with the high school counselor, she dropped one course, changed jobs for more reasonable work hours, and quit the basketball team. She graduated 10th in a class of 440, is working for the summer, and will enter William and Mary this fall.

BETH

Beth began attending camp when she was a sophomore at a small rural high school in an isolated community. While very bright, she was receiving little support from her family. By her senior year Beth had moved away from home, rented a house, bought a car, and was working 40 hours a week. The camp took her to the first play she had ever attended and opened the door to the world of anatomy and a career in medicine. During the spring camp, we surprised her with a birthday cake. She wrote: *"I just wanted to end with a special thanks to Mrs. Heath and Mrs. Phelps for my birthday cake. They don't realize how much I appreciated that. Being in this program is like having a family away from home. I make memories here that I will carry with me for the rest of my life."* The Center staff encouraged Beth to come to TTU, but she chose to stay in her community, continue working full-time and commute over 100 miles round trip to another university. Her boyfriend (a high school dropout) wrecked her car and she had to drop out of school. We do not know what she is presently doing.

CAROL

Carol's high school counselor recommended her for Career Camp during her junior year. Carol's family was having problems and she was living with her grandmother. The counselor felt that Carol needed the camp experiences to help her become valedictorian and receive those scholarships which would be necessary if she were to attend college. In the fall of her senior year she and her grandmother were in an auto accident which killed the grandmother and broke Carol's leg. Carol went back to live with her mother, was on home-bound for several weeks, and attended the fall camp on crutches. She was able to return to school and was named valedictorian. She worked during the summer and then enrolled in a large, distant, university. Within one day of moving to campus, she realized it was too large, too far away from home, and that she was not comfortable there. She called her high school counselor who contacted the Equity staff who helped Carol transfer her admission status and scholarships to TTU. For the first year Carol lived at home and commuted. She is now living and working on campus and has completed her sophomore year majoring in Biology. Her goal is to enter a health care profession.

ELLIE

When Ellie was a sophomore, her family moved from out-of-state to a remote rural community. She enrolled in a small high school where she looked, talked, and thought different. Her science teacher recommended her for Career Camp. After being in the program for about a year, Ellie appeared on campus one afternoon to request a letter of recommendation for a National Science Foundation Young Scholar Archeology Summer Program. She was accepted and spent a summer in Illinois on a dig. In ten years she plans to *"have my Ph.D. in anthropology, be excavating sites, travelling the world."*

GRACE

Grace came to the camp from a small rural high school about 75 miles from the TTU campus. Since she has night blindness, the other girls helped her navigate at night at the dimly lighted state park. Grace's boyfriend objected to her participation in the camp, but it did not stop her. She graduated from high school in 1993 and has completed two years at a community college. She has a baby and says she will be enrolling at TTU this fall. She hopes to move to Cookeville but will commute if necessary.

HATTIE

Hattie began attending at the end of her eighth grade year at a school outside our service area. By her junior year she had moved to a different county and was driving alone over 100 miles one way to attend camp. In the summer of 1991, while Hattie was out-of-state visiting her father just before the Camp, we received a letter from a teacher. *"I've enclosed a check made out to the program for spending money for Hattie. She doesn't need to know where it came from. You have our deepest gratitude for helping a truly disadvantaged student."* We later learned that the mother's utilities and phone were in Hattie's name because the mother was behind on bills and that Hattie was the only breadwinner in the home. She graduated from high school in 1994, but her present status is unknown.

JESSIE

Jessie came to Career Camp from a large metropolitan high school. She would "hang out" with the other Nashville girls. One afternoon we took them to the Cookeville Mall; they were amazed at *"HOW SMALL, CHEAP PRICES, SO FEW SHOPPERS, NO BLACK FOLKS!!!"* One summer she participated in a corporate computer internship rather than attend Career Camp. As soon as she was old enough Jessie began working part-time in a mall clothing shop and was then to develop her unique fashion sense. The last camp of her senior year her family was quite late picking her up so we had a long chat. She commented, "It's awful when your folks don't care enough about you to come pick you up. I am ready to move on with my life."

LAURA

Laura came to Career Camp with an attitude. She was bright, troubled, and insecure. Interactions with staff, counselors, and other girls were strained. When Laura was a junior she got pregnant and had an abortion. At the next camp, one of the sessions was on teenage pregnancy and how having a baby changed your life. In the follow-up assignment, Laura was candid about her experience. The support and encouragement of camp staff and the other girls at this critical time resulted in major changes in her attitude and behavior. When a girl in a later camp announced that she was pregnant, Laura commented, "*Doesn't that depress you?*" Laura is graduating. She plans to marry and enter TTU in the fall.

Conclusion

And there are also stories of MOLLY, NAN,... and beyond. Each girl has a story that touches our hearts and compels us to maintain the program. We believe that the program makes a long-term difference in the individual lives of each girl--even those who do not immediately look like success stories. We wish them the best wherever they are and whatever they are doing. We challenge other female professionals and their organizations to develop, fund, and/or support high intensity programs like this one which make significant differences in the lives of individual young women.

ACHIEVING GENDER EQUITY IN ELEMENTARY SCHOOLS BEGINS IN COLLEGES AND UNIVERSITIES

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*This paper was a collaborative effort in which the authors contributed equally and the order of authors listed does not reflect on the degree of contribution.

INTRODUCTION

Teacher expectations and behaviors are key factors to developing student attitudes about mathematics and science. The actions of teachers toward boys and girls is part of children's schooling process, or socialization. Children's beliefs about their ability to learn, thoughts regarding career choices, beliefs about their peers' abilities to achieve and succeed, and the status of gender are influenced by the teacher's treatment.

Although not solely, teachers contribute to children's, and parent's, perceptions of the mathematics and science capabilities of boys and girls. Teachers' beliefs or expectations may be communicated to children directly or indirectly. To further complicate this, teacher expectations and behaviors are determined by influences of *their* own socialization processes. When considering the power of teacher expectations on student achievement and success in school (Good & Brophy, 1991), we must ask, are we socializing boys and girls differently in our mathematics and science classes? That is, are teachers' expectations and behaviors promoting equitable access and opportunity for all to succeed in mathematics and science?

To begin to answer these questions, we need to examine what gender is and how it is developed. Gender is defined in terms of one's gender identity and gender role. *Gender identity* refers to a person's concept of her or himself as female or male, such as, "I am a boy" or "I am a girl." *Gender role* refers to the behaviors and attitudes considered appropriate for males and females as determined by the socialization processes within the participating culture (Golombok & Fivush, 1994). It is important at this point to also distinguish one's sex from one's gender, *sex* being identified as one's biological attributes.

Examining the development of gender, or how children come to construct their ideas about gender, Freud worked under one basic assumption that still influences socialization processes today. Freud believed that "being male and having a penis was better than being female and having a vagina" (Golombok & Fivush, 1994, pp. 59-60). The explanation of masculinity as active and femininity as passive was explained as simply biological superiority. It is this biological fact that lead to "penis envy."

> . . . females come to envy the penis because the penis represents power and control in society. In other words, what little girls come to realize early in development is not that a penis, per se, is important but that having a

> penis means having power and control over one's life, and not having a penis means being denied opportunities and autonomy (Golombok & Fivush, 1994, p. 60).

Erikson (1968) and others argue against the notion of "penis envy" but, regardless of whether it is penis envy or not, girls in today's mathematics and science courses are denied opportunities and autonomy because of teacher expectations and behaviors toward them and others.

Piaget (1966) argues that autonomy as the aim of education is necessary in order for logico-mathematical growth and development to occur. Logico-mathematical growth and development is essential to the construction of mathematical and scientific relationships. If girls are denied autonomy in schooling experiences, they are denied the opportunity to construct their logico-mathematical knowledge.

Teachers' beliefs and expectations can be communicated both directly and indirectly. These direct and indirect teacher communications promote status among children within a classroom. Positive expectations that are communicated directly may sound like, "Exactly, Gretel. Class, it looks as though Gretel has demonstrated that we have a mathematician in our classroom." The positive messages here are sent not only to Gretel, but to all boys and girls engaged in the conversation. Negative expectations are communicated more often then teachers realize and promote negative status. It may sound like, "Girls, if you have difficulty with the science questions, please see me after school." Although the teachers intent may be to establish a practice to promote equity, the message received by both the girls and boys is that the girls need more help in science.

Beliefs are communicated indirectly by teachers as well. A teacher may rarely call on girls during math and science lessons, falsely assuming that girls are not able to answer the questions or that girls prefer to be passive learners. The teacher's intent may be to keep from embarrassing the child in front of her peers, but the actual message sent to students is that girls are less capable in mathematics and science. The female student voices are silenced and achievement in mathematics and science is stifled, both in the eyes of girls and boys.

A single, isolated comment, a *micro-inequity*, may not have lifelong effect on a child, however, children spend many hours each day with their teacher. These micro-inequities serve to create status characteristics within the classroom.

> A status characteristic is an agreed-upon social ranking where everyone feels it is better to have a high rank than a low rank. Examples of status characteristics are race, social class, sex, reading ability, and attractiveness . . . Attached to these status characteristics are general expectations for competence (Cohen, 1994, p. 33).

It is the pattern of teacher beliefs and expectations, communicated to children over time, that lends itself to status inequities that have lifelong implications, that is, several micro-inequities will create an inequity (P. Campbell, personal communication, February 9, 1995). These inequities are problematic in that a child's status allows dominance over a group regardless of competence. When a person's gender, or any other status characteristic, determines ability or competence in all areas, you are dealing with a status problem (Cohen, 1994). As students live with their teacher's beliefs and expectations regarding gender, they fall into the self-fulfilling prophecy which effects their mathematics and science attitudes and performance.

We have demonstrated that teacher expectations and beliefs effect the opportunities for girls to develop the logico-mathematical thinking necessary for growth and development in mathematics and science. Unwittingly, teaching practices founded in inequitable socialization processes continue to dominate American classrooms. In order for equity to occur, awareness of issues related to gender identity and gender role development need to be created. Our efforts to promote such awareness target the pre-service elementary teacher.

TEACHER EDUCATION INFUSION

In most pre-service education programs, equitable practices are not considered a measure of "good" teaching. Equity is a sidebar issue that is "rewarded" a class session, or less, in the more important "content" of curriculum and instruction. The issue of equity is discussed as isolated from the main body of developing teaching philosophies. Mathematics and science courses typically are left to address equity issues as inequities are inaccurately perceived to only occur in these subject areas.

The AAUW report, *How Schools Shortchange Girls*, has challenged our assumptions that girls and boys are treated equally in our public schools (AAUW, 1992). In fact, the study found that girls and boys are treated differently in academics, make different career choices, engage in different family relationships, and perceive themselves and their opportunities differently. The difference in treatment is the same for both male and female teachers, that is, the expectations and behaviors of both male and female teachers are the same in relation to boys and girls. This is a direct result of our biased socialization processes.

As the AAUW (AAUW, 1992) report demonstrates, teachers are unaware of how they interact with students. Despite this report, many teachers are still unaware of their own biased curriculum and instruction practices, and others with heightened awareness do not know how to change their behaviors. It is impossible for teachers, or pre-service teachers, to escape inequitable curriculum and instruction practices because the practice of educating children is embedded in a cultural socialization that is biased. In a grass roots effort to create awareness, pre-service teachers were targeted as change agents in the effort to promote gender equity.

Through a project funded by the Teacher Education Equity Project, TEEP, gender equity was infused in a teacher education program at Boise State University. This program graduates approximately 150 elementary teachers each year. The equity infusion occurred in the senior year, prior to student teaching. Students enrolled in math, science, and social studies curriculum and instruction courses participated in classes promoting awareness of equity issues and strategies for the classroom.

As students constructed their ideas about how children learn and what that means for their future classrooms, equity was perceived as essential to their developing philosophies. The infusion program held the assumption that a powerful teacher is an equitable teacher, and in order to foster equity in their classrooms, the pre-service teachers needed to become aware of equity issues and develop strategies for promoting equity. A pattern of beliefs about a child's capabilities may emerge and continue from year to year unless pre-service teachers are provided the opportunity to recognize and change their misperceptions about boys and girls.

The BSU project unfolded into three components. One component of the project engaged pre-service teachers in reflective examinations of their conceptualized realities of boys and girls. It further asked them to challenge those realities. These reflective examinations promoted pre-service awareness of equity issues in mathematics and science and the implications of those issues in relation to missed opportunities and autonomy. As a second component, the pre-service teachers engaged in many activities, projects, and tasks that promoted the construction of strategies for classroom equity. During their student teaching assignments, the third component of the project, the pre-service teachers were observed using an instrument that documented interaction patterns. These documents were analyzed by the student teachers for equitable pedagogy.

Component One: Conceptualized Realities of Equity

When engaged in reflective examinations of their conceptualized realities of boys and girls, the pre-service students used their personal experiences to determine what the child's realities might be (Van Manen, 1990). Four patterns of individual reality emerged in the reflective writings: those who are immersed in inequitable situations and become aware, those who have observed and possibly participated in inequitable situations and become aware, those who have experienced inequitable situations and are in denial, and those who deny equity issues exist. One reality flows from individuals who have been oppressed and have many stories to relate and equity awareness for this group is validation. A second reality emerges from those individuals who have not necessarily experienced inequities, yet become aware of the equity issues which have impacted others. The third reality involves individuals who have experienced inequitable treatment, and rationalize the treatment enabling the reoccurrence. The last reality emerges from individuals who may or may not have been oppressed, yet deny equity issues exist to the extreme that we need to make changes in our behaviors. In fact, they are typically asking the question, "Why are we talking about this again? or, If I hear one more word about equity, I am going to scream" (Piazza, Caldwell, & Chevalier, 1995).

Component Two: Construction of Equitable Strategies

Pre-service students engaged in constructing their ideas about pedagogical practices which would promote equity. The following is a brief list of the practices which students constructed and their rationale for equity. Cooperative learning was determined an equitable practice because success of the group depends on the success of each member, each student has individual accountability, and coordination of view point is necessary for effective group interaction (Cohen, 1994). Further, it is through the coordination of view point that logico-mathematical knowledge is constructed, promoting intellectual autonomy (Piaget, 1966). Students identified several supportive classroom procedures such as proximity, eye contact, direct verbal communication, and body language which, when the teacher uses them to include all children, promote equity. Mathematics and science activities that promote the construction of knowledge honor the students' existing knowledge and allows them to grow and develop as individuals, regardless of gender. Team building, the process of developing a democratic community within the classroom, promotes capability, contribution, and connections (Albert, 1989 & Gibbs, 1994).

Component Three: Use of Equitable Pedagogy

For this component, university supervising teachers needed to participate in professional development regarding equity issues and their implications for the classroom. This was conducted both formally and informally. Informal conversations were conducted during the bi-weekly supervisors meetings in which 7-10 supervisors were in attendance. Several formal presentations were made to supervisors throughout the year. Equity experts came to campus and provided presentations on equitable treatment of elementary students. One other presentation targeted the supervisors only. During a bi-weekly meeting, a video demonstrating student interaction patterns was viewed and discussed. After this video, supervisors were asked to go out and record interaction patterns observed in student teaching assignments. From the supervisors' efforts, a form was generated to effectively track the interaction patterns of the student teachers and children.

Student teacher comments before and after analyzing the interaction patterns indicate awareness and commitment to equitable pedagogy. They have commented on how easy it is to call on boys because they are so eager and active. They question how to get the passive learners to participate. They recognize that the equitable practices they constructed (discussed above) are not necessarily the practices that cooperating teachers use or allow them to use. They are shocked and embarrassed that even their awareness of the issue does not guarantee their behaviors and expectations will change toward boys and girls.

SUMMARY

Pre-service teachers can become aware of their conceptualized reality of boys and girls, and how that impacts their educational pedagogy. They can challenge these realities and construct new ideas about equitable practice, however, if they do not have a supportive, nurturing environment to continue the process, the efforts may not reach their potential. Equitable teaching is a "becoming" process. Teachers engaged in the art of "becoming" a *good* teacher are engaged in "becoming" an *equitable* teacher.

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A Visit with Marie Curie
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"A Visit with Marie Curie" was a project targeting the attitudes of sixth-grade students in two neighboring suburban public school districts. The project was highlighted by a live dramatization/characterization of Marie Curie at each of the districts' middle schools and by females in science-related fields visiting each sixth-grade classroom. An AAUW Community Action Grant provided the funding for the performances. Appropriate library resources for students and teachers were also provided through local funding. Lesson plans incorporating the presentations and library resources were provided to sixth-grade teachers. The final component was a television program developed by local branch members. Utilizing two of the visiting women in science, "Marie Curie", and two female students, the program aired during American Education Week on a local cable network. School communications and local news media were the vehicles for publicizing the program to parents and the community at large

Theoretical Framework

The overall purpose of the project was to provide positive role models and information for students who are at a critical stage in their career selection process. Parental awareness of the possibilities for science careers was also promoted through this project.

The problem being addressed is the incidence of females not selecting careers in science because they see few women in science careers and they think science is not appropriate for females.

Recent research indicates that careers that do not seem appropriate to the sex of the student are the first to be eliminated. If a student views science as masculine and herself as feminine, a career in science will very likely be discounted, even if the student has adequate abilities in that area. Personal interviews (conducted previously to this project) with high school females enrolled in physics and calculus indicated that the stereotypical masculine image of science is still in existence. Although these females knew it was a stereotypical image and they had continued to enroll in science and math classes, they did not deem math and science careers as appropriate for them.

The approach to the problem was selected based on the need for positive role models from both the past and the present. The example of Marie Curie is significant because she was able to balance all aspects of her life as well as pursue a career in science. Meeting successful females in science piqued students' interest more than simply reading about them.

Sources of Data and Methodology

During early Fall, 1994, sixth-grade students at eight middle schools in two school districts (about 2200 students) completed the following assessments prior to the dramatic presentations:

1) Draw a Scientist
2) Name a Scientist (male and female)
3) A 10 item survey regarding their attitudes about science and females in science

These pre-assessments were grouped by school, type of assessment, and gender. Results were tabulated by the local Initiative Task Force.

Prior to these events, the following resources were provided to each teacher or school:

1) Books about females in science were purchased through local funding for each school library and made available to teachers and students.
2) An integrated curriculum unit was available for use by classroom teachers, which included suggested activities/lesson plans, some of which were based on the performance or library resources provided by the grant and local funding. Therefore, the language arts and social studies teachers of each team, not just the science and math instructors, could participate in the project with students in their classes.
3) Materials to conduct the science experiments seen in the Marie Curie performance were given to each school so that students could replicate the activities in their own classroom.

In October 1994, students attended an assembly, "A Visit with Marie Curie," at their own schools. Following the performance within one or two days, at least five women in science-related fields visited each of the eight middle schools. These females were recruited by the grant's Project Director for 15-minute sessions with five different classes at one school. A total of 37 women were involved in the school visits. The women were given written instructions to speak with students about their company, job, or career, but more importantly, to share more personal information about their family life or how they became interested in their current career.

Post-assessments, identical to pre-assessments, were conducted and analyzed in the same manner as the pre-assessments. Project evaluations were completed by the visiting females in science and by the teachers.

The final component of the project was the creation of an half-hour TV program, "Women in Science: A Local Perspective," written and produced by local branch members. The program took the audience through the lives of women today with science-related careers. They shared their experiences on how they reached that level of scientific achievement, and what obstacles were placed in their path. In addition, the creator of the original dramatic presentation, "Marie Curie - Scientist, Mother, Humanitarian" discussed how she was drawn to research Marie Curie, a dynamic scientific woman. Clips of the performance were incorporated into the program, as well as a brief discussion with two female students regarding the impact of the performance on them personally.

Results and Their Implications

1. Positive attitudinal changes in both males and females regarding females in science:

Percentages increased for both females and males regarding "When I grow-up, I'd like to be a scientist or work in a science-related field" and "Women can combine successful science careers with successful marriages."

2. Increased student/teacher awareness of female scientists:

The percentage of students who could name a male and a female scientist increased dramatically. Teachers are now more aware and now have easily available resources to guide student learning about female scientists.

3. Changes in students' perceptions of scientists:

The percentage of students who drew a female scientist increased dramatically, especially in the female group.

These positive attitudinal changes in students, increased awareness, and changes in students' perceptions of scientists should encourage all students, but especially the females, to consider a career in science as appropriate for them, and to continue to select classes and activities that will enable them to pursue careers in science. The information provided to students, teachers, and parents by "A Visit with Marie Curie" will open or at least continue to hold open the doors to a science career for all students, which may ultimately aid in attaining equal participation of females in science.

Schools will bear the cost of the assembly program for 1995-96 school year and networking with the females in science will continue. A longitudinal survey to be completed when these students are eighth graders is a definite possibility.

Time Line for "A Visit with Marie Curie"

1994

February	Secured approval from two school superintendents to pursue project
March	Explained project to eight middle school principals
April/May	Principals explained project to appropriate teachers and determined performance time for Fall, 1994
May/June	Project Director coordinated performance times for schools with "Marie Curie" Initiative Task Force members secured additional outside funding from community businesses for purchase of library materials Initiative Co-chair presented list of library materials for task force approval
June	List of selected materials given to each middle school library
July	Curriculum materials developed by Initiative Task Force members
Aug./Sept.	Project Director recruited females in science-related careers Initiative Task Force members distributed and discussed pre-assessments, materials for library, curriculum, and experiments with teachers Pre-assessments by students completed during first days of new school year
Sept./Oct.	Performances at schools followed by visiting females in science-related careers Tabulation of over 6600 pre-assessments by Initiative Task Force members and other branch members, guided by Project Director Writing of cable TV program "Women & Science: A Local Perspective" by Initiative Task Force members
October	Post assessments completed by students Tabulation of post-assessments by Initiative Task Force members and other branch members, guided by Project Director Filmed cable TV program "Women & Science: A Local Perspective" Project evaluation forms collected from teachers and visiting females in science-related careers
November	Aired cable TV program "Women & Science: A Local Perspective"
Nov./Dec.	Analysis of data by Initiative Task Force members and other branch members, guided by Project Director

1995

April	Results shared with principals

Pre/Post DRAW a Scientist Results
n= 2172 for Pre
n= 1831 for Post

	# of students who drew MALE scientist		# of students who drew FEMALE scientist		# of students who drew UNKNOWN gender of scientist		# spoiled
	F	M	F	M	F	M	
Pre	437	1053	579	13	17	16	57
Post	169	706	685	119	1	1	152

	% of students who drew MALE scientist	% of students who drew FEMALE scientist	% of students who drew UNKNOWN gender of scientist	% spoiled
Pre	68.6	27.3	1.5	2.6
Post	47.8	43.9	0	6.8

	% of students who drew MALE scientist		% of students who drew FEMALE scientist		% of students who drew UNKNOWN gender of scientist		% spoiled
	F	M	F	M	F	M	
Pre	20.1	48.5	26.7	0.6	0.8	0.7	2.6
Post	9.2	38.6	37.4	6.5	0	0	6.8

Pre/Post NAME a Scientist Results
n= 2173 for Pre
n= 2063 for Post

	# of students who named MALE only		# of students who named BOTH M/F		# of students who named NEITHER		# of students who named FEMALE only		# spoiled
	F	M	F	M	F	M	F	M	
Pre	483	819	204	151	145	103	76	5	186
Post	68	153	758	753	22	27	112	32	138

	% of students who named MALE only	% of students who named BOTH M/F	% of students who named NEITHER	% of students who named FEMALE only	% spoiled
Pre	59.9	16.3	11.4	3.7	8.6
Post	10.7	73.2	2.4	7.0	6.7

	% of students who named MALE only		% of students who named BOTH M/F		% of students who named NEITHER		% of students who named FEMALE only		% spoiled
	F	M	F	M	F	M	F	M	
Pre	22.2	37.7	9.4	6.9	6.7	4.7	3.5	0.2	8.6
Post	3.3	7.4	36.7	36.5	1.1	1.3	5.4	1.6	6.7

Pre/Post Attitude Survey Results
n=2239

Survey Statement	% Pre Total	% Post Total	% Pre Female	% Post Female	% Pre Male	% Post Male
1. I like science. Agreement	83.07	72.44	40.55	38.5	42.52	38.32
2. Want to be in science Agreement	25.01	35.77	11.34	19.79	13.67	19.16
3. Scientists make $ Agreement	64.18	55.43	31.22	29.79	32.96	28.63
4. Female/sci career/marriage Agreement	63.69	67.66	32.96	36.00	30.73	35.28
5. Scientists lonely Agreement	19.38	13.31	7.77	6.12	11.61	8.75
6. Confident ability/science Agreement	76.6	69.27	37.16	36.2	39.35	37.2
7. Scientists boring Agreement	20.29	16.35	10.27	8.44	10.32	9.51
8. Female/sci discovery Agreement	85.93	78.87	42.97	42.34	42.97	41.05
9. Scientists work hard Agreement	86.65	78.29	43.19	41.94	43.37	41.05
10. Sci research/male=female Agreement	87.49	79.68	43.46	42.66	44.04	41.63

Women's Studies on Campus: Possibilities and Challenges for Gender Equity[1]

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Many people at Brock University believed in 1991 that as soon as the Women's Studies program officially began, the winds of change would blow across the campus and gender equity would become a reality. This paper, written by the first Director of that program, examines why, over the three years after its inception, some possibilities were realized while many challenges remained.

Women's Studies, Academe and Democracy

It is useful to identify three stages in the "re-emergence of feminism in Canada" since the 1970s.[2] The first stage was marked by the report of the Royal Commission on The Status of Women (1975) and focussed on the elimination of sex differences and gender stereotypes. Research and political lobbying in this stage heralded the need for educational changes in textbooks, teacher and parental attitudes and policies, and procedures in schools at all levels which blocked the advancement of women into the highest levels of administration. The impact of such a push for change was felt sporadically across institutions and perhaps more strongly in elementary schools than in secondary or post-secondary institutions. Importantly, however, initiatives from the 1970s, such as the establishment of feminist journals, research institutes and funding programs, fostered an infrastructure for a developing scholarship on women.

. The second phase focussed on revaluing the female. In 1982 the Canadian Women's Studies Association was founded and from 1983 to 1985 five regional chairs in Women's Studies were funded by the Secretary of State. These Canadian developments were linked to an international feminist critique within and across a growing number of traditional disciplines. Around the world, women's groups were actively advocating social, economic and political change.

In its third and most recent stage, feminism has come to recognize the diversity of perspectives needed to rethink and reform all areas of human interaction where individuals or groups are overtly or covertly oppressed. Moving from critique to construction, feminists of many different backgrounds and traditions have been grappling with myriad contradictions, the limitations of existing research methodologies and political strategies and complex questions about knowledge itself. Global perspectives and local actions have been employed to foster social changes which include the diverse needs of such groups as native women, women with disabilities, francophone women, lesbians and immigrant women and girls.

In many respects, Women's Studies programs in Canada and elsewhere have developed and continue to operate in "opposition" to existing practices and structures within education. They hinge on what Cocks calls the "tension point between philosophy and poetry, abstract thought and concrete experience, culture and counter-culture, objective and subjective force, domination and rebellion and last but not at all least masculine and feminine".[3] Some of these oppositions are preserved within Women's Studies, others are reconciled, dissolved or broken into fragments. In this paper attention is paid to three areas- restricted access, discipline-based boundaries- to see how we can increase our understandings concerning both the possibilities and challenges which Women's Studies programs currently provide. Our experiences at Brock are used as a starting point for discussion of issues which may go beyond our particular location.

Restricted Access

Women's Studies came to Brock, as it did to most Canadian universities, through the work of a small number of enthusiasts. These feminists insisted that Women's Studies was a legitimate scholarly undertaking, consistent with one mission of the university - the search for truth.[4] In our efforts to expand access for women and others, within the university, however, we at Brock have sometimes not sufficiently examined our own "partiality." Rooke warns us:

> ....it is dubious practice to criticize the exclusive, arbitrary and partial nature of patriarchal structures yet continue to replicate them casually, opportunistically, cynically or merely because they are familiar, comfortable and convenient once we have gained admittance." [5]

One important challenge for our program then has been that we have needed to establish the program as a legitimate and respectable academic area of study and at the same time have needed to develop ways to open access to the program to those who have not traditionally been welcomed within academe. This has led to many contradictions. How are we to welcome diversity and still maintain a sense of who we are and what we are about? Numerous problems arose regarding the appropriate scheduling of classes. How could they be positioned to foster attendance by both full-time and part-time students? Should instructors be our well known "stars" or should new people be brought in to add greater diversity to the materials and viewpoints available to students? Should we avoid using the jargon or secret language so commonly used as a way to establish other areas of study as legitimate and important?[6] Will we be denigrated by others for using "everday language" and for dealing with issues perhaps of more concern to those from outside universities than to those within them?

We chose to address such questions with compromises designed to maintain sufficient credibility within the institution but to gradually increase our reach into the community. We opted for a growth model which would take time. Such decisions did not please everyone. Those decisions also had to be made in light of ways we needed to operate because of the existing structures and practices of the institution, many of which were related to the established disciplines and their relative power bases within the organization.

Discipline-based boundaries

Disciplines are formalized at Brock University as faculties or departments and are treated as administrative units. Communication, resource allocation and other important activities occur according to such structures. Because our Women's Studies program was established as an inter-disciplinary program, we had to struggle for resources and legitimacy within this structure. Students and faculty had to deal with the realities of co-majors and cross-appointments which often resulted in heavier workloads, fewer opportunities for scholarships or publications and scepticism regarding vocational and career possibilities.

Our efforts to find an inter-disciplinary space within the institution were complicated by a history that had placed other inter-disciplinary programs in the margins, outside the main business of the university. We strove to address this by housing ourselves within the Faculty of Social Science and under the administrative control of that Dean, with the plan to work as strongly as possible with the Faculty of Humanities and to foster links with other faculties and with other inter-disciplinary programs. This meant that we needed to co-habit, co-sponsor, cross-list, and collaborate with women and men housed in traditional disciplines and strive to avoid being marginalized, exploited, controlled or co-opted in the process.

Linkages with other groups have needed to be carefully examined for their long range benefits to the Women's Studies program and its members. Attempts at co-operation rather than competition, however, have often been interpreted by others as weakness. Those in the program have needed to be self-protective as well as co-operative. We have had to learn to say "NO" in order to conserve our own integrity and limited resources even though others have sometimes viewed this as counter to our stated ideals. Our ability to do so, however, has been limited by the hierarchical structures of authority within the institution.

Hierarchical Structures of Authority

Ferguson points out that contemporary bureaucracy should be considered both as structure and process. It is not only a fairly stable arrangement of roles and assignments of tasks, it is also "a temporal ordering of human action that evolves out of certain historical conditions toward certain political ends".[7] As such an ongoing process, it must constantly be reproduced and any opposition must be located and suppressed.

Our Women's Studies program strove to be a democratic unit in the larger bureaucratically organized whole. As such, we encountered persistent challenges. We often tried to work collectively, to make decisions with the participation of all members, and to function co-operatively without the need for hierarchy. We employed strategies such as a rotation of leadership, an integration of social and organizational activities,[8] the formation of sub-committees for specific task completion, the use of newsletters which inform and allow for input, and the establishment of regular informal and interactive speaker series or forums. Such strategies, however, were not without shortcomings. Principal among these was the time needed to work in this way and the limitations on available time due largely to bureaucratic processes within the larger organization. Also, being so used to bureaucracy, many individuals, both teachers and students, became frustrated with what seem to be inefficient procedures.

Schniedewind[9] points out that ideally the feminist values of community, communication, equality, and mutual nurturance should be a part of every Women's Studies classroom. Participants should come to know each other as people, speak honestly, take risks and support each other. The realities are that students and teachers may be so used to hierarchical structures and their manifestations that they may experience many contradicitions as they strive to enact such feminist ideals. Sustaining Women's Studies classrooms as sites of resistance and possible change means that we must foster on-going examinations by teachers and students of shifts in the historical terrains upon which we may act as social agents.

Conclusions

In a pamphlet published in 1897, John Dewey stated that "in the ideal school we have the reconciliation of the individualistic and the institutional ideals".[10] I have argued that my experiences in Women's Studies pointed to three major tension points in our attempts to develop such a reconciliation at Brock through the establishment of our Women's Studies program.

The first tension point was restricted access. We experienced a familiar battle here between notions of liberty and equality. I would argue , however, that our Women's Studies program now acts as an important site for debate and action regarding these complex topics.

A second tension point was discipline-based boundaries. Our Women's Studies program offered students and faculty an important opportunity for interdisciplinary and cross-disciplinary work. A major challenge however was how our program could develop within larger structures which consistently worked to marginalize it and our work. I would argue, however, that our struggle to gain legitimacy without compromising integrity is illustrative of how change can occur and our program continues to provide a site where interdisciplinary work is highly valued and can be nurtured. From our strength comes the possibility of further strength.

A third tension point was the hierarchical structures of authority within universities. Within our Women's Studies program we refused to "take the strength of that power at face value".[11] Through many of our practices, we actually offered alternative structures. In doing so, however, we were challenged not only by those outside the program but by those within it as well. I would argue, however, that sustained work can improve people's understandings of the need for alternatives and the many merits they have. Thus, Women's Studies programs can be vitally important sites for on-going institutional renewal. What we need to do is convince members of the organization that ultimately such renewal can be in their best interests.

Women's Studies programs offer some exciting possibilites within universities at this juncture in history. They allow us to imagine "moments when...entirely new desires, identities, ideas and actions become explicitly possible and quite conceivably actual."[12] My experiences as Director of a newly established Women's Studies program have clarified for me some of the practices and structures that work against such moments but I am strongly convinced that they can be achieved.

ENDNOTES

1. This is a revised and shortened version of a chapter by the author which has been published in Democratic Teacher Education: Programs, Processes, Problems and Prospects John Novak (ed.) 1994 SUNY Press, pp. 47-62

2.Jane Gaskell and Arlene McLaren, Women and Education: A Canadian Perspective (Detselig, 1987) p. 4.

3.Joan Cocks. The Oppositional Imagination (Routledge, 1989) p. 1.

4.Margaret Gillett. We Walked Very Warily: A History of Women at McGill (Eden Press, 1981), p. 47.

5. Patricia Rooke, "Re-ordering our partiality: Reflections on Careerism and feminist commitment in academia" The Journal of Educational Thought 1989, p. 117.

6.Ibid., p. 112.

7.Kathy Ferguson, The Feminist Case Against Bureaucracy. (Temple University Press, 1984), p.6.

8.Ibid., p. 207.

9.Nancy Schniedewind, "Feminist Values: Guidelines for Teaching Methodology in Women's Studies.", Learning Our Way: Essays in Feminist Education edited by C. Bench and S. Pollack (The Crossing Press, 1983).

10.Dewey as quoted in John Miller and Wayne Seller. Curriculum perspectives and practice (Longman, 1985) p. 76.

11.Ibid., p.216.

12.Cocks, 1989, p. 221.

Sexism Perception in Nursing Education: The First Step Toward Achieving Equity

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Recent events, popularized by the media, have brought the issue of sexism and inequitable treatment of women into everyday discussions. Some students may experience inequities in their education and may face sexism in their interactions with faculty. Sexism is any subtle, overt, or covert action or practice leading to differential treatment of people because of preconceived sex stereotypes (Benokraitis & Feagin, 1986; Benson & Vincent, 1980; Hall & Sandler, 1982; Husen & Postlethwaite, 1985). Sexism may occur in educational settings and may arise from a variety of sources including teaching materials (both written and verbal) and the interactions between people in the classroom. During faculty-student interactions, faculty attitudes and faculty behaviors create a climate that communicates a message about individual worth. This classroom atmosphere influences students and affects their personal, academic, and professional development.

Hall and Sandler (1982) describe the "chilly classroom climate" in the educational setting and they make suggestions for change. Even though this document is widely referenced many faculty members may still be unaware of the behaviors and subtle messages that contribute to sexism in faculty-student interactions. Hall and Sandler (1982) identify areas for further research, including the exploration of sex-based differences in faculty-student interaction in post-secondary education and studying the influence of sex of teacher and sex of student on classroom behavior. These suggestions provided the basis for this research. Nursing education was selected for this study because of the high number of women in nursing and the traditionally oppressed and stereotypical role nurses have assumed.

Purpose

The purposes of this descriptive study were to explore faculty members' perception of sexism in faculty-student interactions through the use of vignettes, to compare male and female faculty members' perception of sexism in clinical and classroom vignettes that represent female, male, and gender neutral students, and to compare the effect of selected personal and professional factors on faculty members' perception of sexism in faculty-student interactions.

Literature Review

Researchers have studied gender differences and sexism in the classroom for several years. Various factors have been hypothesized as influencing the classroom climate. The research literature suggests that the class size, course level, course topic, sex of teacher, faculty training, and sex of student may influence the faculty-student interactions in the educational setting (Boersma, Gay, Jones, Morrison, & Remick 1981; Crawford and MacLeod, 1990; Long, 1986; Sadker & Sadker, 1990; Sternglanz & Lyberger-Ficek, 1977; Thomas, 1983). The wide disparity of time between these studies raises concern regarding the applicability of the findings to education in today's society. Also, these studies used various research methodologies and tools to gather data about the classroom environment and sexism. The exact influence of these factors upon the educational environment is not clear. Additional updated research is needed to describe the factors that influence sexism perception and behavior. Since the literature suggests that sexism occurs in college classrooms irrespective of discipline (Thomas, 1983) a study of nursing education was undertaken. Therefore, results of this study may have implications for nursing education and other higher degree programs.

Method

A descriptive design employing comparisons and correlations was used to conduct this research that explored nursing faculty members' perception of sexism in faculty-student interactions in nursing education.

Instrumentation

Subjects in this study were asked to read two sets of vignettes that described faculty-student interactions in nursing education situations. After reading each vignette faculty subjects were asked to respond to various statements that explored sexism by completing the Sexism Evaluation Tool (SET), a 14-item tool. Subjects responded to the SET by using a 5-point Likert scale ranging from strongly disagree to strongly agree. Finally, each subject completed the Personal and Professional Background Questionnaire (PBQ) a tool used to gather information about each subject's background including their experiences with sexism.

Faculty read two sets of three randomly ordered vignettes (for a total of six individual vignettes). Each set of vignettes contained a faculty-student interaction involving sexism but the gender of the student in the situation was changed. Each set of vignettes utilized a female specific situation, a male specific situation, and a gender neutral situation. One set of vignettes involved a classroom situation and the second set of vignettes involved a clinical situation.

The vignettes were developed by the researcher after an extensive literature review. The tools underwent content validity testing by a panel of six experts. The content validity index for the retained vignettes was .79. The content validity index for the 14 items selected for the final SET was .91.

A pilot test utilizing 22 nursing faculty members was conducted to establish reliability. Pilot testing established test-retest reliability for the vignette pairs (clinical vignette $\underline{r}$ = .76, $\underline{p}$ < .001; classroom vignette $\underline{r}$ = .72, $\underline{p}$ < .001). The internal consistency for the pilot test yielded the coefficient alpha, using Cronbach's alpha, for each of the SET scores ranged from .75 to .95.

Scoring

Responses on the SET were entered for each individual item and then summed to yield a total SET score for each vignette. Gender specific sexism scores were also calculated by summing the two female SET scores, the two male SET scores, and the two gender neutral SET scores. The scores for the clinical and classroom vignette responses were also summed. Finally, a total sexism score was calculated by summing the scores on all six vignettes.

Procedures

Internal review approval (university) for research with human subjects was obtained before initiating the pilot test and final study. Mailing lists from the National League for Nursing (NLN) were obtained. Faculty members that belonged to the Council for Baccalaureate and Higher Degree Programs were included as possible subjects for this study. All male names that appeared on this mailing list ($\underline{n}$ = 25) were included as subjects in this sample. A table of random numbers was used to select the female subjects from the NLN faculty names ($\underline{n}$ = 420). Snowball sampling was also implemented to obtain a large enough sample of male faculty members teaching in baccalaureate and higher degree programs in nursing. The snowball sampling was initiated through a message requesting names from an Internet nursing bulletin board. Additionally, 33 male nursing faculty were obtained via this method.

Data collection procedures were adapted from the Total Design Method described by Dillman (1978). Each subject received a packet of information in the mail including a cover letter that included directions and ensured confidentiality and anonymity, the research instruments printed in booklet form, a preaddressed and prestamped return envelope, and a return postcard. After completing the instruments, subjects were to return the questionnaire in the envelope provided. Subjects were also asked to return the postcard that was used to determine nonrespondents. Approximately two weeks after the initial mailing a reminder postcard was sent to all nonrespondents. A second follow up letter and packet of information was sent to all nonrespondents approximately four weeks after the initial mailing.

Sample

Questionnaires were returned by 346 subjects for a response rate of 72.4%. The sample consisted of mostly women (85.2%); however, 40 (14.8%) males returned the questionnaires. The subjects were primarily Caucasian (90.9%) and ranged in age from 33 to 79 with a mean age of 51.6. Subjects were employed in diverse educational settings and across faculty ranks. Over 60% of all faculty had experienced sexism, primarily as a student or educator. Male subjects reported an even greater frequency of sexism (80%) than the female subjects reported.

Results

Data analysis

All data were coded upon receipt and analyzed using the Statistical Package for the Social Sciences on Personal Computer (SPSS-PC). Quantitative data were analyzed using descriptive statistics, t-tests, Chi-square, and multiple regression.

Findings

Faculty members' scores for each vignette ranged from 14 to 70. Faculty members' perceived the least amount of sexism in the gender neutral vignettes (mean scores 36.7 and 37.6). The mean scores on the female vignettes (mean scores 51.4 and 51.5) were slightly higher than the mean scores on the male vignettes (mean scores 48.4 and 48.5).

Two-tailed paired t-tests were computed to determine the effect of the gender specific SET scores on faculty members' perception of sexism. Findings revealed that faculty ($N = 286$) perceived significantly more sexism in the female specific vignettes than in the male specific vignettes ($t = 11.00$, $df = 285$, $p < .001$). Nursing faculty also perceived significantly more sexism in the male specific vignettes ($t = 17.78$, $df = 284$, $p < .001$) and female specific vignettes ($t = 17.78$, $df = 284$, $p < .001$) than in the gender neutral vignettes. Similar findings were reported even when the faculty responses were analyzed separately for male and female subjects. Two-tailed t-tests for independent samples revealed that there were no statistically significant differences between the male and female faculty and their scores on the gender specific SET scores and there were no statistically significant differences between faculty members' perception of sexism in the clinical or classroom vignettes.

The only statistically significant factor to emerge during stepwise multiple regression was personal experience with sexism. Personal experience accounted for 3.6% of the variance ($R = .19$, $p < .005$). Chi-square analysis revealed that significantly more male nursing faculty experienced sexism than female nursing faculty (chi-square = 6.21, $df = 1$, $p < .05$).

Discussion

Nursing faculty members have varied perceptions about sexism. Personal exposure to sexism may have influenced the responses to the vignettes. Faculty may be able to perceive sexism in the faulty-student interactions because they have experienced sexism in their own educational background. Since faculty perceived sexism, possibly because of personal experience with sexism, these findings may suggest that sexism appears to be a continuing problem. Faculty should not only be able to perceive sexism if they have personally experienced sexism, but they need to understand and attend to the problem.

The data revealed that faculty perceived significantly more sexism in the vignettes with student sex identified than in the gender neutral situation. Findings also revealed that nursing faculty perceived significantly more sexism in the female vignettes than in the male vignettes. Since most of the professional literature and the popular conception of sexism suggest that sexism focuses primarily on women, many faculty may hold this "popular" belief about sexism thus providing support for the finding. However, faculty should not ignore other situations where sexism may occur.

These research findings have implications for disciplines other than nursing. Men in nursing experienced sexism, possibly due to their minority status in a female dominated profession. Females in traditionally male dominated professions may have similar experiences of sexism in educational settings.

There were no significant differences between the perceptions of male or female faculty. Both groups indicated they had experienced sexism, therefore, it may be the personal experience with sexism that influences perception of sexism rather than gender.

There were no differences in sexism perception based on the vignette setting (clinical or classroom vignette situation). This finding supports the work of Sadker and Sadker (1994) who suggest that sexism occurred in all disciplines and classes that they studied.

Educators must recognize the impact that sexism makes on students. The socialization that education provides forms a lasting impression that stays with students into their professional careers. Faculty need to consider how they are treating all students in the classroom. They should determine if their interactions allow for all students to feel valued, regardless of student or teacher gender.

The first step in eliminating sexism in nursing education is perceiving and identifying the problem. Scores on the SET items indicate that nursing faculty perceived some sexism in the simulations. They perceived sexism when gender was identified in the vignettes, and they perceived less sexism when no student gender was identified in the vignettes. Faculty members' ability to perceive sexism helps to achieve one of the first steps of sexism identification and may help lead to the elimination of sexism. The final outcome is for faculty to change behavior in the direction of non-sexist teaching.

Acknowledgements

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MULTICULTURAL TRAINING FOR GRADUATE TEACHING ASSISTANTS

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Background

Changing scientific and technical education demographics have led in the late 20th century to the appointment of significant numbers of graduate teaching assistants, many of whom are international, at U.S. institutions. Although these teaching assistants may possess high levels of knowledge and skill in their chosen fields of interest, few possess teaching skills that include implementation of gender, race, and culture equity in the classroom. To address this lack, Southern Illinois University at Carbondale (SIUC) has put into action a multicultural training program for its 1,500 graduate teaching assistants (approximate number of graduate assistants per semester in the academic year). The program consists of a two-day workshop jointly directed by the Graduate School, the College of Education, Library Services, and the Women's Studies Program. The training provides participating teaching assistants with gender, race and culture fair strategies pertaining to course content, methodology, and classroom management.

Institutions of higher education must satisfy education and training needs of students and employers as technology advances and the need for higher degrees increases. One challenge will be to prepare additional university faculty. According to Hensel (1991), colleges and universities will need 335,000 new faculty members in the next decade. A major method for preparing university personnel has been graduate assistantships. Graduate assistants not only learn advanced course work in their disciplines, but also become socialized into their professional roles. In general, assistantships have been viewed as professional development for university faculty.

The Problem

Despite this apparent need for good teaching at the university level, a growing number of writers have contended that the primary emphasis in training for graduate students is on research, not teaching (Bass, 1993; DeNeef, 1993; Hutchings, 1991; Selvin, 1992). The consequence of this focus has been noted by Selvin, "The nearly exclusive focus of graduate study on research does not simply neglect graduate students' commitment to teaching and their desire to become good teachers; it actively discourages that commitment" (1993, p. 6). So great is the problem that the Department of Education, through its Funds for the Improvement of Post Secondary Education (FIPSE), provided funds to the Association of American Colleges (AAC) to complete a three-year project entitled, "Preparing Graduate Students for Their Professional Responsibilities of Colleges Teachers." The general aim of the project was to make graduate students aware of the broad range of responsibilities they will assume as faculty members.

Nevertheless, high level projects to prepare teachers rarely, if ever, take into consideration the need to prepare future university teachers for the diversity that already exists in U.S. college classrooms. Teaching assistant (TA) training often includes classroom management, classroom climate, and instructional strategies. However, differing aspects of philosophy of education, appropriate classroom behavior, and expected roles of teachers and students are difficult to incorporate into short-term training, particularly when many of the teaching assistants are not native to U.S. culture. The concept of teaching the American culture to teaching assistants from other cultures gives a whole new slant to "multiculturalism" in the classroom. In addition, where gender, race, and culture are included in training for teaching assistants and future teachers, often it is placed in a separate unit entitled "diversity issues" or "multiculturalism in the classroom." Yet consideration of gender, race, and culture must be closely integrated into every teaching strategy including leading discussions, handling disruptions, classroom interactions between teacher and students, questioning skills, establishing classroom rapport, evaluating student performance, encouraging participation, etc.

The Solution

Southern Illinois University at Carbondale (SIUC) has nearly 1,500 graduate teaching assistants each semester with over 200 of these assistants being international graduate students hired to teach in the university classrooms. In April 1988, a resolution concerning TA training was adopted by the SIUC Graduate Council. The Graduate School was to provide, in conjunction with other administrative units, university-wide training for teaching assistants. In the years following, a number of central administrative units within the university (e.g. Graduate School, Library Services, Center for English as a Second Language/CESL, International Programs and Services, Women's Studies, and the College of Education) have joined together to prepare teaching assistants for their teaching responsibilities.

In 1994 this training was altered in response to data collected in a questionnaire to determine departmental needs for training. A second questionnaire was administered to TAs in training to determine level of awareness of gender, race, and cultural differences and knowledge of strategies for inclusion.
The survey to department heads to determine needs for training consisted of a list of topics and issues that have been covered in previous TA training programs. Topics included in the survey were consistent with those identified by Weimer, Svinicki, and Bauer (1989). They included: Good Teaching Practices, Information Literacy, Involving Students in Learning, Structuring Learning, Building Gender Fairness, Respecting Cultural Differences, Respecting Individual Differences, Making Appropriate Referrals, Review of the Sexual Harassment Policy, and Academic Honesty.

Respondents were asked to indicate (a) their agreement about the importance of topics of issues, (b) which group(s) of teaching assistants would benefit by participating in a workshop that would address the topic or issues, and (c) who should be responsible for providing such training to teaching assistants. A copy of the survey was sent to the chair of each academic department (N=60). A total of 35 responses were received, making a 58.3 percent response rate. At least one response was received from each of the eight colleges with graduate programs. Data were tallied by collegiate unit, and these totals were summed to provide an overall result.

Examination of the results indicate that there was agreement about the importance of all of the topics listed on the survey. For each item, the overwhelming number of respondents concurred that the topics deserved coverage in TA training. The respondents were also clear in their opinion that both U.S. and international teaching assistants would benefit from participating in the training. Finally, the respondents indicated that the responsibility for training should be shared among the Graduate School, collegiate and departmental units.

This survey, as well as surveys completed by other institutions, indicate requests for help with teaching and with culture information. Research reported in the ASHE-ERIC Higher Education Report (1992) verifies the problems resulting from lack of pedagogical skill and culture information. The two needs can be incorporated into one training program without fragmenting them as two separate topics.

The questionnaire designed for use with graduate teaching assistants beginning the training session had two parts. The first part included demographic data concerning gender, race, culture, teaching experience, college, and experience with learning about gender, race, and culture. The second part included questions specifically pertaining to gender, race, class classroom learning theory, classroom interaction information (Sadker studies), and exclusionary language.

The teaching assistant questionnaire is used at the beginning of each training session. Insufficient numbers of the survey have been collected to date to draw conclusions, but early data indicates that 60 percent are male, 50 percent are Caucasian, 50 percent are U.S. citizens, and all are between the ages of 23 and 34. Seventy-five percent have no teaching experience, 12 percent have taken a women's studies course, but 60 percent claim multiculturalism training. Teaching assistants were able to answer correctly questions about teacher attention, classroom interaction, race, and class differences only about 50 percent of the time. Most of the time they answered that they did not know the answer even when provided a list of options to choose from.

Training Contents

The department responses and preliminary teaching assistant responses indicated to those designing the training that TA training needed to include these important topics to prepare university teachers for the future. The training that resulted contains specific training for multicultural awareness, including various American cultures, as well as specific training for American pedagogical style. The unique feature of this training is that the contents are built around pedagogy. Within each unit of training, appropriate culture, race, gender, and age sensitivity information is provided. For example, rather than having a training session with a segment on leading discussions and another section on how to encourage women and minorities to participate more in discussions, information on drawing out all types of students is provided within the unit on leading discussions. In other words, culture and gender issues become a part of pedagogy style rather than an addendum to pedagogy.

The TA training contains information on the process of curriculum integration - making the curriculum more inclusive on race, class, gender, and ethnicity. The training includes three components: (1) increasing personal knowledge on race, class, gender, and ethnicity; (2) transforming content and structure of courses to meet the learning needs of diverse students; and (3) changing the classroom dynamics to provide a more inclusive environment for all students (Higgenbothem, 1988). The training also includes analysis of perspective, stereotyping, sexism, racism, ethnocentrism, and eurocentrism that may be reflected in textbooks and educational materials.

If training time is sufficient, TAs are provided with a review of the five phases of curriculum development as described by McIntosh (Anderson, 1988). These phases are: women being absent from the curriculum, women added to existing material as exceptional representatives of their race and/or gender, women as 'problem or anomaly' regarding traditional theories, women as the focus of the course/research, and curriculum that is inclusive of all people and represents the diversity in human society and culture. An important resource as TAs move through this process is the provision by the Women's Studies Program of topical bibliographies pertinent to various disciplines and courses of study. These bibliographies serve as a basis for making revisions in the readings or syllabi entries to result in a more diverse approach to the subject.

Another example concerns sexual harassment training which is required to all university faculty and staff at SIUC. Information about cultural interpretation of sexual harassment and special problems that this can cause for international TAs and international students is addressed.

Summary

The goal of the TA training at SIUC is to: help students understand the ways in which race, class, and gender differences have historically created and maintained the privileges of a few; encourage students to appreciate the achievements, contributions, and perspectives of diverse peoples; introduce students to the incredible diversity of methods, processes, and modes that have been and can be utilized in pursuit of knowledge, truth and beauty; and develop a curriculum and pedagogy that effectively combats racism, sexism, and other forms of prejudice by empowering students to value themselves, their culture, their history and those of others.

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Multiculturalism in Mathematics Instructional Materials

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Evident in the current mathematics education reform is increased attention to the sociological and ideological considerations which influence the development of mathematical content knowledge. Visionary documents such as the *Curriculum and Evaluation Standards for School Mathematics* (NCTM, 1989) call for curriculum design and implementation which embrace issues of cultural diversity.

Such concerns are noteworthy, but a deeper and more critical perspective is needed in attempting to translate theory into practice. Apple (in Carpenter, 1992, p. 413) asserts that "...the nature of inequality in schools, the role of mathematical knowledge in our economy in maintaining such inequalities, the possibilities and limitations of a mathematics curriculum that is more grounded in students' experiences and problems" warrant such critical examination.

Multiculturalism + Mathematics = Opportunity

Whether one embraces the assumptions of an existing model of multicultural education (Banks, 1994; Nieto, 1991; Sleeter & Grant, 1994), or whether one maintains an eclectic approach, a comprehensive understanding of multicultural education must address issues of content knowledge, process, opportunity, and language. Bowers and Flinders (1990) assert that regardless of the model of teaching which educators practice, elements of culture will invariably be transmitted and mediated.

Fundamental assumptions of the prevalent models of multicultural education include:

- In the United States, a multicultural society exists in which schools, communities, and society are inseparably linked.
- Conventional schooling affords those students who possess the cultural characteristics most akin to the cultural norms and expectations of school the greater chance of academic success than those students who are not in mainstream ideology.
- Educators must be acutely aware of their cultural backgrounds and biases prior to implementing practices of multiculturalism.
- Multicultural education is for everyone.

It is in identifying the assumptions of teaching and learning in general, and the teaching and learning of mathematical ideas in specific, that the boundaries of mathematics must be redrawn and curriculum reform must be based. In a mathematical context, the essence of

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> build[ing] upon and reinforc[ing] diverse cultural traditions [rests upon] distinguishing between mathematical ideas and their purely Western expression; distinguishing what is value-laden from what is not or, rather, selecting the values one wishes to transmit from those one does not; understanding cognitive processes and cognitive development across cultures; and developing curricula and creating teaching modes and materials appropriate to different cultural settings (Ascher, 1991, p. 195).

While not all aspects of culture can be appropriately and equally reflected in mathematics instructional materials, more can be done to diversify the meaning and purpose of being mathematically literate in our society. In an attempt to expand the Western conceptualization of mathematics, Ascher (1991) suggests the concept of *ethnomathematics*. This perspective of mathematics stresses the importance of contextualizing all mathematical ideas,

> involves the study and presentation of mathematical ideas of traditional people, [and] has the associated effect of enlarging the history of mathematics from dealing primarily with the Western professional class called mathematicians to involving all sorts of people (Ascher, p. 188).

Assessing Mathematics Instructional Materials for the Inclusion of Multiculturalism

One component of curricular reform is the examination of instructional materials for their representation of diverse cultures, including values, beliefs, customs, and language. Having clearly identified the assumptions and theoretical constructs of an education that is multicultural, the task of assessing instructional materials becomes logically simplified. By translating these beliefs into criteria which may be seen and heard, mathematics instructional materials (e.g. textbooks, computer software, manipulatives, videotapes, educational games, and other artifacts) can be examined from multiple perspectives such as mathematical content, applications, and the use of language.

Foremost in the process of critical analysis, must be a concern for the cognitive and affective influence which each of these materials contributes to the learning process, particularly textbooks. Kachaturoff (1982) suggests that "the textbook and/or program should communicate values basic to the American democratic society in a global perspective, reflect quality scholarship and thoughtful design and construction, be educationally sound, and support and complement the basic design and objectives of a particular school's curriculum" (p. 33). While Krachaturoff's fundamental, yet comprehensive idea does not present itself in a checklist format, it does afford educators a powerful opportunity to interpret and define these qualities in ways which best reflect the needs of their school culture.

Examining graphic and textual material for cultural diversity goes beyond a mere tally of the number of times people of various groups, including class, gender, race, and handicap, appear in illustrations or on a screen. While attention to stereotypical and erroneous depiction and tokenism is important, so too is the focus on the determination of explicit and implicit assumptions which textbook publishers and video and software producers make about what is considered worthy knowledge, by whom, and for what purpose. In other words, how do uses of language and illustrative examples serve to emphasize certain types of mathematical knowledge, frame mathematical concepts and contextualize their application in the real world?

Fundamentally, an analysis of mathematical instructional materials, linked with curriculum issues, must "...point to four elements that distinguish teaching that puts gender, race, and class [and other forms of oppression] at the center of attention: incorporation of students' experience, attention to the learning process, recognition of how the culture is reproduced in the classroom, and the creative use of conflict as a basis for change" (Schoem etal, 1993, p. 2).

Research Ideas for the Classroom

Classroom research is necessarily informed by educators' own explicitly and implicitly stated beliefs, attitudes, and values regarding human diversity and frameworks which reflect the ideals of the school culture. Acknowledging that instructional materials, pedagogy, and curriculum are integrally related, the following questions serve as an impetus to inform and reform the teaching and learning process which reflects multiple ways of knowing in the mathematics classroom.

- What is the significance of incorporating a multicultural perspective in the mathematics classroom, in light of how you define multicultural education?
- What are students' assumptions and beliefs about learning and how are these consistent with the beliefs which the school culture holds?
- How do the mathematics instructional materials which are used in the classroom support or deter from education that is multicultural?
- What are students' perceptions of bias in printed and visual instructional materials? What are the effects of these perceptions on learning?
- In what ways can mathematics instructional materials which are biased, stereotypical, or omissive be used constructively to promote and affirm cultural diversity in the classroom? In what ways can such materials be used to promote student and teacher social action to address and correct offensive practices?
- What assumptions about assessment do developers of instructional materials make?
- How can mathematical instructional materials be used to teach cultural diversity to monocultural groups?
- What value is placed on multiple forms of communication and metaphorical use of language?

These questions, considered in tandem with the use of such guides as *Standards For K-12 School Mathematics Programs in Pennsylvania* (PASCD, PCTM, & PCSM, 1989) challenge all educators to honestly self-assess and conceptually develop their ideology of an education that imbues multiculturalism. Embracing the idea that "knowledge is necessarily subjective, interpretive, and contextualized" (Peterson & Knapp, in Cawelti, 1993, p. 136), mathematics educators have a professional responsibility to interrogate their curricula with this assumption.

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The Effect of Gender Inequity and Role Socialization on Registered Nurses' Attitudes Toward Interdisciplinary Collaboration

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Nursing is primarily a female occupation whose origins in military and religious organizations and development within a system that placed it under the control of medicine have added a "professionally submissive role to its traditionally submissive female role" (Cohen, 1981, p. 9). Nurses are divided into opposing camps; those that have internalized the values and norms of the traditional role and are comfortable with or even deny the existence of their submissive role, and their counterparts who struggle against the inequity associated with the profession (Cleland, 1971; Cohen, 1981; Roberts & Group, 1973). It is posited that these external and internal conflicts affect nurses' attitudes toward themselves and other nurses, and are reflected in their collaborative roles with other health-care professionals. As registered nurses comprise the largest percentage of health-care professionals employed within a hospital setting, their attitudes may have a marked impact not only on their own self-esteem and professional advancement, but also on the profession and its efforts at interdisciplinary collaboration.

The purpose of this study is: (i) To compare the attitudes of nurses and other health professionals toward interdisciplinary collaboration; and, (ii) To compare the perceptions of nurses and other allied health professionals of barriers to interdisciplinary collaboration which have resulted from the effects of gender inequity and role socialization on the nursing profession. In order to identify barriers to interdisciplinary collaboration, the following questions will be examined: (i) Do the perceptions of nurses and other health professionals differ as to the value placed on their input by others; (ii) Do the perceptions of nurses and other health professionals differ as to the existence of intimidation in collaborative situations; (iii) Do the perceptions of nurses and other health professionals differ as to the attitudes of hospital administrators and physicians toward interdisciplinary collaboration; and, (iv) Do the perceptions of nurses and other health professionals differ as to the status associated with and the ease of entry into other health professions. The results of the study will serve to identify the need for change in both the curricula of undergraduate and graduate programs in nursing, and in nursing's practice settings to offset the impact of gender inequity and role socialization on the profession.

The Oppression Model provides a theoretical framework from which to study the effects of gender inequity and role socialization on nursing. The development of the nursing profession, and benefits and barriers to interdisciplinary collaboration will be examined.

Oppression Model as a Theoretical Framework

Nurses can be perceived as an oppressed group in which leadership behavior has been controlled by societal forces. This view is supported by the presence of issues within nursing practice such as decreased autonomy, accountability, and control over their profession. The effect of oppression is reflected in nurses' negative attitudes toward themselves and other nurses. The effect of oppression can be expanded to include evidence of nurses' negative attitudes toward others like themselves--other allied health professionals. The Oppression Model serves as a framework to explain the divisiveness and competitiveness that exists within the nursing profession which may be reflected in nurses' attitudes toward interdisciplinary collaboration (Roberts, 1983).

Development of the Nursing Profession

Nursing grew out of an apprenticeship system and was initially influenced by military organizations, organized religion, and medicine (Cohen, 1981; Welch, 1980). Later it fell under the influence of hospital administration. The influences of these authoritarian cultures are reflected today in its educational and administrative systems, and in the issues and problems with which the profession continues to struggle which include the level of entry into practice, the degree of professional autonomy, and attrition from the profession (Cohen, 1981; Welch, 1980).

The relationship between nursing and the Women's Movement has been guarded. The American Nurses' Association failed to support women's suffrage or the ERA as it believed that its involvement in these issues would negatively reflect on nursing's professional image. Later, feminists denounced nursing as a traditional and, at times, oppressive female occupation. In more recent years nurses and feminists are finding common ground but their alliance is played out against a cultural backdrop of the devaluing of the caring role of nursing and the overvaluing of the curing role of medicine (Cohen, 1981; Welch, 1980). In addition, the media's depiction of nursing has frequently had a negative influence on its image (Reverby, 1993; Welch, 1980).

Nursing students and nursing faculty are to a degree isolated from other college students and faculty (Cohen, 1981; Reverby, 1993; Welch, 1980). While nursing students attend interdisciplinary classes, students in other areas are not usually allowed to enroll in nursing courses. In addition, nursing faculty most frequently collaborate with those within their own discipline. Collaboration, which can offer an opportunity to see one's profession and one's self through the eyes of others, is, thus, minimized.

Benefits of Interdisciplinary Collaboration

With today's pressure to maximize client outcomes while containing costs, there is an increased emphasis on the need for interdisciplinary cooperation among health-care professionals. Benefits of interdisciplinary collaboration include coordination of patient care, cost containment, improved patient outcomes, and increased knowledge of the skills and expertise of other health-team members with a resulting increase in receptivity to the input of other health-team members (Kaplis, 1983; Luecht, Madsen, Taugher & Petterson, 1990; Mason & Parascandola, 1972). For health professionals to work together in a collaborative and cooperative manner they must develop attitudes of: (i) Openness and receptivity to ideas other than their own; (ii) Value and respect for other disciplines; (iii) Interdependence and acceptance of a common commitment to comprehensive patient care; and, (iv) Willingness to share and take responsibility (Basoff, 1990). It has been demonstrated that teaching strategies can be effective in developing some abilities, such as understanding the functional roles of each discipline, that are requisite to the development of these attitudes (Stubblefield, Houston, & Haire-Joshu, 1994).

Barriers to Interdisciplinary Collaboration

The social stratification that exists within the health professions is due in part to gender inequity and role socialization with resultant role stereotyping, professional dominance, interprofessional competition, and perceived differences in status. Social stratification is reflected in barriers to interdisciplinary collaboration which include decreased valuing of the input of some health-team members and their subsequent intimidation in collaborative situations (Basoff, 1990). It is apparent that teaching strategies alone are not sufficient to overcome these barriers to interdisciplinary collaboration.

Method

A pilot study was designed to compare the similarities and differences between nurses and other allied health professionals in relationship to their attitudes toward interdisciplinary collaboration and their perceptions of barriers to collaboration. This study was replicated in Fall, 1994 to increase the size of the sample. Data analysis is now in progress.

Based on a review of the literature pertaining to interdisciplinary collaboration, an eight-item survey instrument was developed. Participants were surveyed as to their own attitudes toward collaboration and their perceptions of the attitudes of physicians and hospital administrators. Participants were asked to rank order the barriers to interdisciplinary collaboration as identified in the literature from 1 (most important) to 4 (least important). These barriers were identified as role stereotyping, interprofessional competition, intimidation, and status differences. Participants were asked if they felt their input was valued by others, and if they ever felt intimidated in interdisciplinary problem-solving situations. Items were also included to measure attitudes related to the social prestige and ease of entry into the health professions of nursing, dietetics, and physical and occupational therapy. Data were analyzed using nonparametric techniques.

Sample

Participants (registered nurses = 7, occupational therapists = 3, social worker = 1, and dietitian = 1) completed the survey instrument. The participants, all female, ranged in age from 27 to 49 ($X = 37.58$) and ranged in years of professional experience from 3 to 27 ($X = 11.58$). The participants comprised the student population of a graduate program in health care services designed to foster interdisciplinary collaboration.

Results

Attitudes toward collaboration

Registered nurses' attitudes toward increased interdisciplinary collaboration were compared with the attitudes of other health team members. All study participants expressed a desire for increased interdisciplinary collaboration. The attitudes of health-team members toward interdisciplinary collaboration were also compared with their perceptions of the attitudes of physicians and hospital administrators. Both physicians and hospital administrators were perceived as being in favor of increased collaboration. Despite the positive attitudes expressed toward interdisciplinary collaboration, 75% of the participants stated that they did not participate in interdisciplinary problem solving.

Barriers to collaboration

Participants did not view any of the barriers to collaboration as having a greater effect on practice than the others. The perceptions of nurses and other health professionals of the social prestige associated with the various allied health professions (nursing, dietetics, physical therapy, and occupational therapy) and the ease of entry into the professions did not differ. When these data were re-analyzed, no differences were found between the above mentioned professions in terms of prestige and ease of entry. There was no statistically significant difference between the perceptions of the registered nurses and the other health professionals represented in the sample as to the value placed on their input by others. 92% of the participants stated that they perceived their input to be valued,

The differences between registered nurses' and other health team members' perceptions of the existence of intimidation in collaborative meetings were analyzed using a Fisher's Exact Test. The results were not found to be statistically significant at the .05 level. However, 50% of the participants stated that they did at times feel intimidated in interdisciplinary problem-solving situations. In the replication of the study, 50% of the participants also stated that they, at times, felt intimidated.

Discussion

The results of this pilot study were inconclusive. The instrument was refined, the study replicated, and data analysis is in progress to identify the influences of gender inequity and role socialization within the nursing profession.

There were no statistically significant differences between the attitudes of nurses and other health professionals toward the aspects of interdisciplinary collaboration under investigation. As all study participants were women, this finding may be a function of the existence and effects of gender inequity and role socialization within all of the disciplines studied, and not just within the nursing profession. The lack of significant results may also be related to the small sample size, problems with the survey instrument itself, or be unique to this sample. It can be suggested that the attitudes of students enrolled in interdisciplinary graduate programs may differ from those of students enrolled in discipline-specific programs.

All participants expressed positive attitudes toward interdisciplinary collaboration. However, 50% of the participants stated that they at times felt intimidated in collaborative situations, and 75 % stated that they did not routinely participate in collaborative problem solving. These findings need to be reexamined to determine if the effects of gender inequity and role socialization are related to the inconsistency of responses.

Leininger (1971) stated that for interdisciplinary collaboration to be effective, the social stratification existing within the health professions must be eliminated. However, nursing cannot wait for society to change. Change must be implemented from within the profession (Roberts, 1980). If in replicating the study in Fall, 1994, a relationship is found between the effects of gender inequity and role socialization and nurses' attitudes toward interdisciplinary collaboration, it is essential to identify the impact on the profession and its individual members as a first step in implementing change. The effects of gender inequity and role socialization cannot be allowed to continue to permeate the profession, and hinder personal and professional growth and efforts at interdisciplinary collaboration (Cohen, 1981; Reverby, 1993; Roberts & Group, 1973). Educational and practice influences, that may be perpetuating distorted views of the profession and maintaining the maladaptive behavior associated with oppression, must be reexamined. Positive attitudes toward interdisciplinary collaboration cannot be developed upon a foundation of inequity. In order to develop attitudes requisite to effective collaboration, nurses must first earn to value and respect themselves (Welch, 1980).

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Sustaining Girls Voices: The Women and Girls Collaborative Theatre Project

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The Women and Girls' Collaborative Theatre Project was formed in an effort to resist the silencing that girls experience with the approach of adolescence. The concept of bolstering girls' self esteem and recovering women's self esteem was a strong focus of the project. The process involved women and girls working together to create drama about issues that girls face as they become adults.

The project included two parts which took place over two semesters. The pilot project took place in the Spring of 1994. The workshop was held as a class through the Arizona State University Theatre Department. It included various goals ranging from working with elementary school girls to creating a performance piece from childhood memories. The themes and ideas gathered from this pilot project were used in a continuing project focusing on girls, which took place in the Fall of 1994.

Much of the stimulus for this project came from literature about girls' self concepts, theatre collaboratives, and the theatre in education process. Meeting at the Crossroads, by Harvard psychologists Lyn Mikel Brown and Carol Gilligan notes that, prior to adolescence, girls have greater self-confidence, more assertive voices, and clearer perceptions of their relationships with the world they live in.

The researchers found that through teenage acculturation a girl will give up speaking about her authentic experience with relationships. She defines who she is in relationship to others: "a giving up of voice, an abandonment of self, for the sake of becoming a good woman" (2). A girl will give up her relationship with herself, in order to remain in relationship with society.

The study calls for women and girls to work together to strengthen their ability to express themselves with confidence: "We offer a vision of women and girls dancing at the crossroads of adolescence, moving in relation to one another so that it becomes possible for girls and women to stay in relationship and to say what they know" (219). Women need to remember their own adolescence in order to recall their disconnection with themselves. "Such remembering seems essential if women are not going to justify or reimpose on girls losses which they have suffered" (224).

AAUW's (American Association of University Women) How Schools Shortchange Girls, looks at reasons for the drop in achievement shown by girls as they grow up. The study states that most research ignores girls by lumping girls' and boys' educational needs together. "This lack of specificity perpetuates the invisibility of girls and compromises the education of our nation's students" (2).

In her book, School Girls, Peggy Orenstein explores self-esteem in 8th grade girls. Orenstein illustrates how a hidden curriculum is prevalent in the classroom.

> This hidden curriculum is said to be evidenced by the fact that boys receive more teacher attention, are encouraged to explore more on their own, while girls are rewarded for silence, neatness, and conformity. (Rebell and Murdaugh 196)

Ways of Working

The preceding literature calls out for action in the lives of women as well as young girls. In order to put these ideas into practice the Women and Girls' Collaborative Theatre Project utilized collaborative methods often used by Feminist Theatre troupes. Feminist Theatre groups have worked together through collaboration to confront the issues that are important to them. We also made use of Theatre in Education (TIE) methods which are effective in dealing with social issues. Tony Jackson, writing in the introduction to Learning Through Theatre underscores the efficiency of TIE to explore issues and challenges:

> One of the major and most effective features of TIE is the structured active participation of the children in the drama--frequently placed within a dramatic fiction in which they become caught up in its events, interact with a range of characters and have to make decisions in the midst of 'crises'; or at an older age, invited to challenge or advise characters from a play they have just witnessed. (2)

This literature about girls' adolescent development as well as the different methods of working in theatre became a catalyst for the year-long Women and Girls Collaborative Theatre Project, that used drama to confront the issues that girls and women face in society. My major goal in the project was for women to connect with themselves so they would be better able to connect with girls. We could then help girls maintain a strong sense of self as they move through adolescence.

The Pilot Project

The pilot project was made up of eight undergraduate and graduate women from diverse backgrounds who were interested in theatre and girls' education. Working without the traditional, hierarchical, playwright-director-actor approach, the group created drama from the experiences of all the participants, with each person contributing equally to the drama in a collaborative effort.

The pilot project culminated in a performance piece called "More Than Parts," which dealt with the ways that women are portrayed in the media as well as the messages that women and girls receive everyday. The performance used a number of devices to make it's point. We showed slides of women in magazine ads., accompanied by rock music with lyrics describing the objectification of women. We created a scene in a body shop where a teenage girl goes to choose her new adolescent body. We looked at how fairy tale princesses wait for their prince charming. We also created a ritual of movement and sound, celebrating the onset of menarche.

One of our goals for this performance was to create a montage rather than a linear dramatic story. We wanted to challenge the audience's view of women by challenging their view of what is expected in performance, and we tried to change the parameters of what is seen as the status quo in performance as well as in society. We created a non-traditional playing space, with chairs facing all different directions. There were three playing spaces where different scenes took place. Some scenes occurred simultaneously, giving the audience a choice of what to look at. At times, we bombarded the audience with sound and flashes from cameras, and at one point, We covered their heads with sheets so they couldn't see. The actors were also on stage at all times, and the audience saw them watch other scenes out of character.

The participants felt it was important that the workshop create a performance. One workshop member offered the following comment about the performance in her journal:

> I felt the goal of the performance was to exhibit a healthy reflection of the idealized and commercialized view of women's bodies. I do feel like we reached that goal. I'm proud of us for that. Without performing our class would have not been a theatre class but a self-help group.

Another woman said she was afraid to share her personal story in public, but that the performance had an empowering effect on her. Other women also felt the empowerment: "we weren't just tools for the playwright. It was ours, we are the actual artists." For one woman the whole process became a personal tribute to her mother. The women agreed that the performance became a consciousness raising event.

The performance piece received positive responses from the audience. Many said they saw the need for these concerns to be voiced. Some audience members were moved by the honesty of the event, and angered by the truthful portrayal of the objectification of women in the media and in life. One woman said that the piece was "true theatre" because it was more honest than other so called "real theatre" that she was used to.

Although working collaboratively had its challenges, it succeeded in expanding the views of the participants. I feel that this segment of the project presented the participants with unique situations that were educationally and personally challenging. It also dealt with personal issues that are not often raised in a university setting.

Part Two: Focusing on Girls

The focus for the continuation of the workshop was girls and growing up female. This part of the project took place in the fall semester of 1994. The project focused on working in the classroom with 5th grade girls. Three women from the first phase of the project worked collaboratively to create eight drama sessions. These sessions focused on equipping girls with the tools to survive adolescence with their self esteem intact. They included the themes: listening to your own voice, gender roles, holding on to dreams, body image, sexual harassment, and bonding between women and girls.

We created goals that were large in scope so that we could cover diverse issues during our theatre sessions. We wanted to encourage girls to keep their strength of voice as they move through adolescence. We also wanted bonding to take place between the girls as well as between the girls and women in the group. We wanted to create relationships with the girls outside of the familiar daughter/parent or student/teacher relationship.

The project worked with 14 girls from a local Phoenix, AZ elementary school. The girls came from diverse backgrounds. The group included, seven hispanic girls, four white girls, two native American girls and one Asian girl.

We decided that before we could create the sessions we needed to know who we would be working with. We created a preliminary lesson where we could find out about the girls. As part of the preliminary lesson the girls were asked to draw personal shields to express themselves. They were asked to draw what type of food, animal and object they would be and explain why.

Many of the girls, drawings described a dichotomy of feelings inside of them. Their pictures and descriptions showed that they struggle with feeling mean and nice much of the time. Some girls drew pictures illustrating this dichotomy: "A dog, because dogs are sometimes nice and sometimes mean." She drew two different hearts: "Sometimes I'm loving sometimes I'm not". For her shape she drew a, "weird shape because sometimes I'm mean." When asked to draw their object, one girl drew a heart and a broken heart. She wrote: "outside of me I feel happy a lot. Inside of me I feel heart broken." One girl drew an apple for the type of food she would be. She wrote, "I picked an apple because sometimes I'm sweet and sometimes I'm rotten." The shields were used to express how the girls felt about themselves and their bodies. One girl drew broccoli: "I'm not everyone's favorite." She also drew the floor for her object: "I get stepped on all the time." Another girl drew the sun and wrote, "because I'm proud of myself."

The concept of body image emerged throughout the lesson. One girl wrote, "I feel like a carrot because my family thinks I'm skinny." She also wrote, "I feel like a rectangle because I feel too skinny and I sometimes don't like it." Another girl wrote, "People see me as an O because I'm fat and I don't fit in their world." Another girl wrote, "I'm lettuce because I have to lose weight." This session allowed us to see who we were working with. The themes of body image and the dichotomy of feeling nice and mean emerged from this session.

Each of the following eight drama sessions started and ended with a ritual. We wanted to create a safe place for the girls to enter into each time, a place where they could risk sharing their true feelings. For the opening ritual we all created a long archway with our arms for each girl to go through. A bell was rung as each girl went through the arch. Each girl would then say "something positive about yourself." The group would respond by saying "[name] we honor you."

The closing ritual focused on a king size sheet that the girls wrote on. The girls each took hold of a piece of the sheet and lifted it above their heads and allowed it to float down three times. The girls would then write and draw on the sheet, describing their feelings about the lesson for that day, or responding to questions that we posed to them. We used the sheet as an assessment tool.

Each drama session became an opportunity for the girls to deal with issues that effect their lives. The sessions on body image and sexual harassment brought about very thoughtful responses from the girls. After the sexual harassment session the girls were asked to write a letter to the editor of the school newspaper describing their feelings about sexual harassment. "Dear editor, I think people should have a right to go to this school being safe not being scared." Another girl wrote about seeing sexual harassment: "I once saw my friend getting harassed by her step-brother. I felt scared."

This lesson called for the girls to help a friend with a problem. The girls had to come up with solutions to the problems of sexual harassment. They were required to understand the term sexual harassment and be able to defend themselves when questioned about its validity. They also learned about helping each other in hard situations. This lesson gave the girls a safe place to deal successfully with a problem which may be an unpleasant reality for them now and in the future.

After the lesson on body image the girls were asked to write on the sheet about positive things about themselves, and how they think and feel about their bodies. The reflections were very thoughtful and belied the girls torn feelings about their body image. The following are quotes from the sheet:

> "I'm good at singing and swimming and jump rope. I feel I am fat but when people encourage me I feel different sometimes, but I will never starve myself."
>
> "I think that women who starve themselves are crazy, because people should like themselves like I like me. And some times, I feel I'm really fat and I need to go on a diet."
>
> "Sometimes I feel like starving myself but sometimes I feel great about me, not all the time though."

At the closing of the final session the girls took time to write on the sheet about things they want to remember about the class. We all agreed that the sheet became very meaningful to the girls. The writings were important to them, and they were excited about doing it.

The following are final comments from sheet:

> "The class had made me very confident about myself and boys can't touch me. My spirit feels much better that I know I'm not fat."
>
> "I will always remember the session about Sally being touched where she did not want to. I will take everything I have learned from this class."
>
> "During this class I've learned how important it is to think good about ourselves."

Through discussion with the girls' classroom teacher, Mrs. Row (pseudonym) I found that we did have an influence on the girls. According to Mrs. Row "The girls were thrilled that they've dealt with issues they need to know about. One girl wrote in her journal, 'Thank god we are learning about these things, maybe I'll have a good future'" (Row) Mrs. Row gave credit to the workshop for the girls' new desire to express themselves: "The workshop has heightened their awareness towards their own feeling, and they know their opinions count. As a result of the group, the girls felt it was ok to write something that doesn't make you feel good when you write it" (Row).

Mrs. Row also describes the bonding she observed between the girls:

> Now the girls will stand close to any one. They don't have to be with the popular one. If they are standing next to someone, that's their friend for the day. They seem to have a respect for each other. They look at each other with value rather than labeling one girl heavy and another girl smart. (Row)

The comments brought up in discussion and the reflections written on the sheet showed the comfort and trust levels created in the workshop. The girls' participation level showed interest and enthusiasm for the issues.

As far as long lasting impact, I feel we created strong memories for both the women and the girls. The girls experienced women valuing them as people and taking their issues and life experiences seriously. They were able to thrive in a place where they could risk disclosing their genuine feelings.

I feel that the work we did was valuable, because everyone, especially girls, needs a safe place to express themselves and ask questions about things they wonder about. I find myself thinking about the girls that we worked with. What will happen to them as they grow up? Will they be able to express themselves with confidence? How will they combat the sexual harassment that is present in the public schools? Perhaps, knowing what it is like to be valued will help them to value their own life experiences.

This project made me aware of the hidden curriculum that plays a large role in students' lives. I feel theatre can play an important part in exposing the hidden curriculum and dealing with its issues. From the response to our work it seems that there is a need to create an environment where girls can take risks. Theatre is an important element in this environment because it can set up conditions for girls to face issues that they will face in life, but in a safe place with people to help them get through it. By creating these sessions we worked to validate the feelings and wonders that girls don't usually get permission to explore.

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Gender Equity in Mathematics Instruction

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Introduction

Gender differences in mathematics achievement in the United States is a concern of national interest. A 1992 report by the American Association of University Women (AAUW) states that females take fewer advanced mathematics courses than males, and choose careers in mathematics and science in disproportionately lower numbers. Yet, both males and females start out life with seemingly similar abilities to perform mathematical tasks. However, the AAUW report states that from birth and throughout childhood, society has differing expectations for males and females. Such expectations cause varying behavior patterns in children, depending upon gender.

Reyes and Stanic (1988) believe that during the primary grades females perform as well as males on mathematics tasks. But gender differences in achievement begin to be obvious in the middle school grades, particularly in application and problem solutions. Reyes and Stanic suggest creating gender equity in mathematics achievement can be enhanced by heightening teacher awareness of student attitudes towards mathematics, and making instructors aware of teacher attitudes toward students. Teachers should be alert to what is occurring during mathematics instruction, and should monitor classroom conditions to create equity for girls and boys. Hensel (1989) states a supportive and stimulating environment, free of gender stereotypes, can facilitate the growth of essential traits in males and females that will compensate for existing differences, and creating equal learning and performance in mathematics between the sexes.

The AAUW (1994) report states for females, notions about school performance correspond to student-teacher relationships. The AAUW report (1992) maintains differences in teacher assessments of boys and girls result in a lack of perseverance in academics and a lack of confidence in themselves by girls. The concept may explain why girls are often not as persistent as boys in seeking academic challenges.

According to Reyes and Stanic (1988), mathematics knowledge is necessary for members of our society to be able to join in the democratic processes and to be unhindered in choosing a career and taking advantage of opportunities for advancement. Hensel (1989) states gender differences in mathematics learning and performance still exist, despite the current emphasis on equity of the sexes. The under-representation of women in technological and scientific fields, the number of women who do not choose to pursue a study of mathematics, and the evidence showing male dominance in mathematical achievement have created many questions for persons who want an answer to the puzzling situation.

The AAUW report (1992) posits what a student learns in school has lifelong effects. Women comprise 45 per cent of workers, and this percentage is on the rise. However, women are working in a narrow field of jobs thought to be suited for them. Sixty percent of women who work outside the home work in services, clerical or professional areas, and above 60 per cent of professional women work in female-dominated jobs such as nursing or teaching. Tobias (1990) states women constitute 50 percent of the population and 44 percent of the workforce in the U. S., but make up only 13 percent of functional engineers and scientists.

The AAUW report (1992) affirms women earn less money than men even when their education is the same, and when they hold the same jobs. The subjects females study in school make the difference. Wage differentials are less or nonexistent for females in their early thirties who have earned more than eight mathematics credits in college. However, in order to take mathematics courses in college, females must have a high school background in mathematics, and females must believe they are capable of learning mathematics.

Bradley (1981) affirms the quick and complicated interactions in the classroom situation render a difficult situation for a teacher to be aware of the extent of teacher influence, without special training. Teachers should be taught how to get and interpret feedback on teaching behavior. By securing and analyzing teacher behavior, a teacher may ascertain the effect of teacher performance on students. After gaining insight into his or her effect on learners, the teacher may decide to modify his or her behavior to maximize positive influence on his or her students. Teachers should have a wide repertoire of teaching methods from which to select those most suitable for a particular student or classroom situation.

Methodology

The purpose of the study is to determine whether or not intervention with elementary teachers through teacher in-service will alter teacher practice in the classroom. The study involves the designing and testing of strategies to change teacher behavior toward gender equity in mathematical instruction.

Description of the Population. Participants in this experimental study were teachers from two elementary schools in Northwest Arkansas. The community is located southeast of Fort Smith, Arkansas, with a population of approximately 4000, and a school district enrollment of 2625. During the course of this study, the schools were in transition due to the building and hence relocation of students and faculty.

Teachers participating in the study taught grades 4 to 7: two from fourth grade, two from fifth grade, four from sixth grade, and two from seventh grade. Three male and seven female teachers were included in the study. One teacher had earned a master's degree; the other nine held bachelors' degrees. Teachers' classroom experience ranged from one to twenty-five years. Three of the teachers had fewer than ten years' experience, three teachers had between 10 and 20 years of experience, and five teachers had between 20 and 25 years of experience. The ages of the teachers ranged from 30 to 48 years; two teachers were in their 30s, and the remainder in the 40s decade. Participants were volunteers.

Procedures. Before the study was initiated, eight fourth grade teachers were informed about the experimental study by the investigator. Teachers were advised the project would involve observation and videotaping of mathematics instruction from which data would be collected for an experiment. Teachers were told introductory observations would involve videotaping of three 20 minute sessions of mathematics instruction for each subject and that in-service training would follow the taping sessions along with videotaping of three subsequent mathematics lessons. Teachers were invited to join the experiment on a volunteer basis. Out of the group of eight, two fourth grade teachers volunteered to participate in the experiment. One of the teachers later withdrew her name, and another fourth grade teacher agreed to take her place.

The investigator met separately with fifth and sixth grade teachers from another school. Again, teachers were told an experimental study would be conducted by the researcher concerning mathematics instruction. The seven mathematics instructors were told the experiment would involve videotaping of three 20 minute mathematics lessons from which data would be obtained for a study. Teachers in attendance at the meeting were informed of the in-service session that would be held concerning mathematics instruction and of the three 20 minute videotapings of mathematics instruction to follow the in-service. Volunteers were requested for participation in the study, and six of the seven teachers present at the meeting agreed to engage in the study.

Because of time constraints and scheduling concerns, two seventh grade mathematics teachers were contacted individually. Each teacher was told the details of participating in the experiment.

Baseline Data Collection. A total of 10 classroom teachers volunteered and were observed and videotaped teaching 20 minute mathematics lessons on three separate occasions. No constraints were placed on teachers about the topic of instruction. Mathematics teaching was observed on fourth, fifth, sixth, and seventh grade levels. A variety of mathematics instruction was observed. Videotapes were later analyzed for verbal interaction between teachers and students.

In-service Treatement. After completing the videotaping sessions, an all day in-service for the ten teachers participating in the experiment was held by the researcher. Parent volunteers substituted for the teachers on the day of the in-service training. All 10 teachers were present for the training.

As part of the introduction to the all day session, participants shared names, grade levels, and schools. Desks were arranged in a semi-circle in the classroom to facilitate group discussion. After the brief introduction period, with the aid of an overhead projector, the investigator stated the purpose of the in-service. Next, the instructor distributed a fact sheet to teachers concerning math myths. Participants were asked to classify each statement as either true or false. After statements were identified as true or false, the researcher gave the correct classifications of items. Teachers engaged in a discussion of the information presented in the fact sheet, and facts were verified with research.

Following the introductory exercises, a knowledge base about gender equity in mathematics instruction was shared with the teachers by the researcher. Areas addressed were achievement and participation of boys and girls in mathematics in school, characteristics of boys and girls in terms of development, and interests and activities from early through later childhood. Information was shared about the attitudes of males and females toward mathematics during the school years. Also discussed was teacher expectation of student performance and differential treatment of boys and girls in the classroom. As an outcome of some of the above areas, societal implications for females were explored. During a brief break midway through the morning session, teachers discussed information, and observed materials about the gender issue. After the break, the remainder of the knowledge base about gender equity in mathematics instruction was related.

After lunch, the teachers brainstormed possible interventions for creating gender equity. Following the brainstorming session, the researcher suggested teacher-related interventions as well as interventions for pupils, based upon the research.

Subsequently teachers were asked to respond in writing with their earliest childhood memory of mathematics. Next teachers were asked to write about a pleasant or unpleasant experience with mathematics. Participants were asked to discuss the experiences and memories they had written of with the group.

Showers (1990) states that in-service training based on theory has little impact on skill development in teachers. Showers (1990) further states increased knowledge accompanied by immediate opportunity for practice of the new skills, strategies or materials generates competency that allows teachers to immediately transfer new knowledge to classroom practice. Therefore, teachers were then asked to engage in a role playing activity. Based on Showers' work, three scenarios were set up. The first scenario involved characters in role playing of Janey Larken and the teacher of the Camp Miller School described in Blue Willow by Doris Gates (1940). The second scenario involved Hab Bowditch, his younger brother Nat, and Master Watson, teacher of a one room school in Salem in the late eighteenth century. The characters are found in Carry On Mr. Bowditch by Jean Latham (1955). The final scenario involved Sophie Germaine and her parents, characters in a script from the Women's Educational Equity Act Program(1984). Each scenario was performed separately. First, workshop participants were given written descriptions of the characters and the scene. Teachers were given time to read the scenario, and volunteer for parts. Each scene was acted out in approximately five minutes. At the conclusion of each scene, participants in the role playing and observers of the scenarios were asked to brainstorm how attitudes toward mathematics would have been affected had the scenarios actually occurred. After the initial discussion, participants were asked to consider how attitudes toward mathematics would have been affected had the scenes been played out differently.

At the conclusion of the workshop, participants were led in a webbing activity: "What did we learn?" Next, teachers were asked, "How can we apply what we learned to our classrooms?" A discussion immediately followed the webbing activity.

Follow-up Data Collection. During the month following completion of the in-service, the 10 classroom teachers were again observed and videotaped during three 20 minute mathematics lessons. Videotapes were analyzed to determine the frequency of teacher interactions and types of teacher interactions with boys and girls, and wait-times.

Description of Measures. The Flanders Interaction Analysis System (FIAS) for categorizing verbal classroom behavior was used to report the types of student/teacher interactions. Results of teacher behavior during mathematics instruction before and after intervention were analyzed and compared to determine if there were significant gender differences in interaction.

After the experiment was completed, the researcher viewed the videotapes of the classroom lessons. Frequency and types of teacher interaction as well as wait time were classified on forms designed for data collection. The pre in-service tapes were viewed and coded. The first coding session involved recording tallies for frequency of teacher interaction with boys and with girls. The second viewing of the pre in-service tapes was for the purpose of recording data about the length of wait-times afforded boys and girls by the teacher. Wait-times were recorded to the nearest second, and time was recorded from the end of a teacher question to the beginning of a student answer. The third viewing of the classroom lessons gave the researcher the opportunity to record types of student/ teacher interaction with boys and with girls. The FIAS was designed to measure verbal teacher behavior, without regard to gender of the student. The researcher went one step further and identified the gender of the student. A time sampling approach to recording data was used in preserving information about student/ teacher interactions. Every three seconds, for two minute periods, verbal teacher behavior was recorded in one of the ten FIAS categories. For the next four minutes, nothing was recorded. At the end of the four minute period, information about student/ teacher interactions was recorded every three seconds for the next two minutes. The pattern was followed throughout each 20 minute lesson. After the initial round of pre in-service tapes were coded the identical procedures were followed with pre and post in-service videotapes.

Statistical procedures. After coding the videotapes, data were summarized for the three categories for each teacher: frequency of teacher interactions, types of teacher interactions and wait time. Averages were computed for frequency of interactions, types of interactions, and wait time, pre and post in-service. Correlated t-tests were used to compare the mean scores of pre and post in-service observations. Research questions were tested at the .05 level of significance. .

In addition to the above statistical procedures, pre and post in-service scores for individual teachers were recorded. A table summarizing all teachers and all interactions was developed. The purpose of computing the individual scores was to show the effects of intervention. The individual teacher charts compared pre and post in-service teacher behavior.

Summary

During the experiment, frequency of student/teacher interactions, types of student/teacher interactions, and wait times given to boys and to girls by teachers were examined. Differences in student/teacher interactions with boys and with girls were recorded pre and posttest. The differences were calculated by subtracting girl/teacher interactions from boy/teacher interactions. Pre and posttest differences were found by administering t tests for dependent measures at the .05 level of significance. Based on the three main areas of consideration, only one significant difference appeared in the area of types of student/teacher interaction. The FIAS category initiating student talk showed a significant difference at the .05 level.

Conclusion

The purpose of the in-service was to determine whether teacher in-service about gender equity in mathematics instruction would produce behavior change in teachers. Varying types of behavior change for different teachers was observable. However, a significant difference in teacher behavior was observed in only one area of types of teacher behavior: FIAS category 9, pupil talk initiation. Differences in frequency of student/teacher interaction, seven FIAS categories, and differences in wait times for boys and girls did not show significant behavior change.

The teacher in-service about gender equity in mathematics instruction was conducted in one day. The differences in teacher behavior were not significant in all but one area. Showers (1990) conducted a survey of research to determine the types of teacher in-service that would produce constant high-caliber classroom performance. When training included theory, demonstration and practice, teachers acquired the competencies necessary to transfer new strategies to classroom practice. Glatthorn (1990) describes peer coaching, including peer observations as well as peer conferences as a method of building upon staff development activities. This writer envisions a teacher workshop concerning gender equity in mathematics instruction as a week long in-service activity in the summer. Teachers would have time to digest and internalize the information about gender inequities and opportunities to practice and internalize the concepts. Follow-up training at regular intervals including peer coaching would facilitate the new learnings. A benefit of extending the teacher training over time would be to give teachers the opportunity of considering the concepts of frequency of teacher intervention, types of interaction and the amount of wait time extended over time. This writer believes when the facts about gender equity in mathematics instruction are presented, and teachers are given the opportunity to role play and practice interventions with peers, new learnings can be successfully transferred to the classroom, and gender equity in mathematics instruction can indeed be attained.

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Seeking the Middle Ground: Helping University Teaching Assistants Deal with Gender Issues

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The role of the teaching assistant (TA) in the American university has traditionally had much in common with that of women in American society: servile, underrecognized, and underpaid. During the 1960s and 70s, when universities experienced a boom in student enrollment, institutions sharply increased their use of graduate students to help manage large classes, run lab sections, grade, lecture, tutor, and hold discussion groups. Today, the practice remains strong, with many universities depending on teaching assistants for as much as 25-38% of their undergraduate instruction (Nyquist, Abbott, Wulff, and Sprague, 1991).

The teaching assistant stands on that uneasy middle ground: part student and part faculty, experiencing the extreme pressures of both roles. She is frequently thrust into the classroom with little or no training and expected to assume the mantle of teacher based on the sole qualification of having been a successful student herself (Allen and Rueter, 1990). As both teacher and student, she must deal with many difficult issues, not the least of which are those associated with gender.

Teaching Assistant Training

Since the mid-1980s, colleges and universities have begun to pay more attention to the training of teaching assistants. The first national conference on the employment and training of TAs was held at the Ohio State University in 1986 (Chism, 1986). The University of New Mexico Teaching Assistant Resource Center (TARC) was founded by communication professor Dr. Jean Civikly-Powell in 1984. For the past decade, TARC has offered training to teaching assistants in the form of a six-week series of seminars entitled "Classroom Teaching Skills" and has assisted in promoting a positive experience for TAs both inside the classroom and within their many departments.

As part of the TARC seminars, TAs work on strategies to solve problems posed by their peers from personal experience. These are termed "predicaments" by TARC instructors and are categorized as (1) predicaments with students, (2) predicaments with supervising professors or departments, and (3) predicaments with other TAs. It is not uncommon for TAs to pose predicaments that have gender dimensions, but in the past, these problems have been dealt with as more role-conflict than gender-conflict. With the increased interest, both locally and nationally, on classroom climate for women in the university (See Hall and Sandler, 1982; Sandler and Hall, 1986; Sandler, 1991), the staff of TARC decided to create a two-hour workshop, first offered in the spring of 1994, in which gender-specific, on-the-job problems could be dealt with. Both male and female TAs were welcomed and given background material on gender differences in academic settings. Participants were asked to complete an instructor self-assessment on classroom practices. Discussion centered on research on classroom communication patterns and issues of sexism in the classroom.

Problem Solving of Gender Issues

A major portion of the workshop was devoted to generating solutions to predicaments which had been posed by teaching assistants in previous TARC seminars. A specific gender was assigned to the imaginary TA in each predicament, and after solutions were generated, the participants were asked to propose appropriate solutions for a TA of the opposite gender. Examples of some of these were the predicaments are listed below:

You are a female teaching assistant:

A male student in your class is very domineering and always tries to "one-up" you. What do you do?

A male student is making sexist remarks to a female student next to him. You feel his attitude is highly insulting to the female student, but she just giggles and lets it go. What do you do?

You teach a lab, and the male TA who uses the lab the hour before you do doesn't clean up the mess that his students have left behind. What do you do?

You are a male teaching assistant:

You sense a female student is flirting with you and "becoming too friendly." What do you do?

A female student accuses you of making a sexist statement. You explain why you don't see it that way, but she doesn't accept it. What do you do?

A female student comes to your office and cries because she has failed an assignment. She says she misunderstood the directions. You feel manipulated. What do you do?

Teaching assistants worked in small, single-gender groups to develop solutions for the predicaments. These solutions were then shared with the whole group, and additional input was solicited, especially along the lines of, "what if the genders were reversed." Both male and female TAs, while not always agreeing, found that the gender of the protagonist in the predicament often did affect the type of response that was suggested. Two themes emerged from the male participants: (1) male TAs were more likely to feel uncomfortable and sometimes manipulated in situations where the student sought personal involvement, and (2) there was a deep level of frustration over assumptions by some female students and colleagues that the males were biased against females by virtue of their gender. Two themes that arose from the responses of female participants both dealt with maintaining respect: (1) a suspicion that aggressive action on the part of students and colleagues of both genders was targeted at them specifically because they were female and (2) a desire to be sensitive to the needs of others without being taken advantage of by students, colleagues, or professors.

Analysis of Problem Solving

Theorists in conflict management have proposed that interpersonal conflicts have both a goal dimension and a relationship dimension (Johnson, 1986; Thomas and Kilmann, 1974). For example, in the case of the female TA finding the lab left unkempt by the previous occupant, she is faced with wanting both a clean laboratory (goal) and a cordial relationship with a colleague (relationship), and her choice of response, according to the theory, would reflect the degree to which each of these things is important to her. But the role of gender seems to add an additional dimension to the conflict. Besides wanting a cordial relationship with her colleague, she also wants respect which she assumes has been denied her because she is female. Her response, then, requires consideration of *one* goal dimension and *two* relationship dimensions, the responses to which may or may not be compatible. Thus, predicaments involving an extra relationship dimension may be more difficult for the TA to solve; and the solutions themselves, much less satisfying.

Another way to view these predicaments is through the lens of Carol Gilligan's work on the moral development of men and women. Gilligan found that there were two basic perspectives from which humans attempted to solve their moral dilemmas: the Care Perspective and the Justice Perspective (Gilligan, 1982). The Care Perspective, which is more often adopted by women (though Gilligan herself is quick point out that neither perspective is exclusive to one gender), stems from *relatedness* and focuses on equity and the multiple responsibilities which affirm human connectedness (Wood, 1986). Thus the solutions sought by female TAs would, by necessity, focus more on preserving the intricacies of the relationship, be it with student, colleague, or supervisor. Wood, however, points out that caring for the relationship does not mean failure to care for oneself (i.e., one's self-respect), since denying self for others "can destroy an individual and, thus, the essence of a relationship" (Wood, p.276).

The Justice Perspective, more often the male one, stems from *differentiation*, and is based on rules, objectivity, and fairness (Gilligan). In this frame, a male teaching assistant is more likely to feel that challenges by students or colleagues are "unfair," rather than disrespectful, and that situations in which he is made to feel emotionally connected to students removes the desired objectivity, putting him at a disadvantage. Solutions from the Justice

Perspective may look quite different from those stemming from the Care Perspective, as, indeed, workshop participants found.

Both male and female teaching assistants agreed that problem-solving specific gender conflicts both in and out of the classroom was a useful endeavor. They found that looking at problems and the communication skills needed to solve them from the standpoint of both their own and the opposite gender enabled them to generate more solutions than before. They did point out, however, that aside from studies on sexual harassment at the university level (See McKinney, 1990; Koss, 1990) there is not much data on gender issues among teaching assistants either within their own university or outside. In view of this consideration, the author undertook to survey teaching assistants at the University of New Mexico in the fall of 1994 about experience with and attitudes toward gender issues.

Teaching Assistant Survey

The survey was conducted among teaching assistants of the Colleges of Arts and Sciences, Engineering, and Fine Arts. Approximately 500 surveys were sent out, and 158 were returned, 156 (or 31.2%) of which were usable as data. Of those those, 77 (49%) of the respondents were female and 79 (51%) were male. Foreign-born teaching assistants numbered 24 (15.4%), with the Republic of China having the largest number, six (all male). The mean age of the TAs was 30, and the median age was 29.

When asked if they had noted any differences in the way that male and female students responded to them as TAs, 42 (55%) of the female TAs said, "yes," and 32 (41%) of the male TAs said, "yes." A chi square test revealed no significant difference at the .05 level ($X^2= 3.08$, $df=1$). Typical of statements by female TAs were, "Females seem to feel less threatened by me," and "The males talk to me like they think they can get away with blowing off class...," but a few females reported the opposite experience: "Males are generally more friendly, more chatty, more curious about my personal life." Typical responses from Male TAs who thought there was a gender difference in students' response were "Female students are more apt to ask for help and visit during office hours," and "Female are often friendlier__even flirtatious__ males often distant, intimidated." Male respondents were mixed as to which gender spoke more in class. Several TAs, both male and female, noted that age may be as important a factor as gender in shaping student response.

When asked if *they* responded differently to students of the opposite gender, 31 (40%) of the female TAs answered "yes," while only 20 (25%) of the male TAs said "yes." These results showed a significant difference between the two groups, $X^2= 3.97$, $p< .05$, $df=1$). Comments among female TAs were mixed, some saying they tried to be especially encouraging to women, others saying they always seemed to learn the males' names first. One remarked, "I tend to privilege women's thoughts more, although I notice that if a male student interrupts, I immediately let him dominate. I try not to, but at least I'm aware of this tendency." Among males, many exhibited a degree of paranoia: "I am always conscious of the fact that when dealing with a female student I have to be guarded. I must watch my language or terminology," while a few asserted the reverse: "I think women are more interested in learning, and I talk to them mostly." Combining the two questions, 53 (69%) of the females felt that there was a difference in communication between genders in at least one of the two categories, while 38 (48%) of the males saw communication differences in at least one category. X^2 revealed a significant difference between the two sets of responses ($X^2 = 6.64$, $p < .01$, $df = 1$).

More females than males said that they had experienced gender related problems in the classroom and within their department, but a X^2 analysis of both totals failed to reveal a significant difference. When asked if they had had any classroom problems or dilemmas that were gender-related, 32 (42%) of the female TAs and 23 (29%) of the male TAs answered, "yes" ($X^2 = 2.64$, $p > .05$, $df = 1$). The types of problems mentioned most often by the females involved challenges to their credibility or authority (53%), with requests for dates or sexual come-ons, second in frequency (25%). Typical of the comments dealing with challenge to credibility were: "I have had situations where male students aggressively try to tell me what I need to do to make the class better..." and "There have been two instances when students (males) have challenged me completely, one involved hostility all semester long..."

Male TAs saw gender-related classroom problems differently. For them, the most frequently mentioned classroom gender problems were flirting students and sexual come-ons (38%). Only two males mentioned any challenge to their authority or credibility, one saying he had felt professionally compromised and sexually harassed once, and the other that "*males* attack me personally." Three males mentioned their own heightened sensitivity to harassment issues, one apologizing for a gender-related joke which he regretted "before the punch line left my lips," and the other two fearful of saying or doing something that would be viewed as harassment ("I feel that men have been forced to over accommodate the recent shifts towards egalitarian relationships." "I personally try to remain neutral during the semester...") One male TA said he was uncomfortable dealing with female students one-on-one, and another stated his dilemma as having had a female student cry.

All in all, the survey reinforced what the workshop participants had found: most TAs felt that classroom patterns of response did seem to differ by gender and that there were issues that could be construed as gender-related, especially that of respect and credibility for women. Classroom conflicts that were seen as sexual in nature were considered problems by both genders, with males identifying slightly more problems than females. The results of the survey have become the basis for a revised workshop for TAs on gender issues which will attempt to look at solutions to teaching assistant predicaments from both the Care Perspective and the Justice Perspective. With combined input from both male and female TAs, it is hoped that workable solutions which promote both the goals and the relationships of students and teaching assistants can be achieved.

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GENDER DIVERSITY ISSUES IN ENGINEERING EDUCATION AT THE UNIVERSITY OF CENTRAL FLORIDA

by

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ABSTRACT

The Women in Engineering (WIE) program at the University of Central Florida (UCF) is conducting research to: (a) assess the educational climate for female engineering students at UCF, and (b) provide strategies for improving their engineering education. The primary goal of this effort is to increase the percentage of female engineering students and graduates. Funded by a one-year grant from UCF's Division of Academic Affairs, the research investigates the gender diversity issues in the College of Engineering at UCF.

INTRODUCTION

The University of Central Florida opened in the fall of 1968. Its original name, Florida Technological University, was changed by the Florida Legislature on December 6, 1978. The University's presently assigned role within the nine-campus State University System of Florida is that of a general purpose institution offering degree programs at all levels of instruction. Its primary mission is to provide intellectual leadership through quality undergraduate and graduate programs. Accent on the Individual and Accent on Excellence underscore the philosophy of UCF.

The College of Engineering is one of five colleges at the 1,227-acre campus located in the Orlando suburbs, 13 miles northeast of downtown. In the Spring '94 semester, there were 3,319 engineering students, accounting for 14.4% of the 23,115 enrolled. For Fall '94, engineering students accounted for 13.2% of the university's 25,363 enrollment. With programs in Civil and Environmental Engineering, Electrical and Computer Engineering, Industrial Engineering and Management Systems, and Mechanical and Aerospace Engineering, the College continues to excel in engineering education and research. These departments maintain modern, well-equipped laboratories and shop facilities. Close liaison is maintained with the Florida Solar Energy Center and the Central Florida Research Park.

Nationwide, women in science and engineering have been receiving much attention this past decade. Recently, the female representation in engineering has begun to decline, and efforts are concentrated to attract larger numbers of women and to retain them in these traditionally male-dominated disciplines. At UCF, gender diversity issues in engineering education are being studied; females account for 17.4% of the undergraduate engineering students. The College of Engineering employs 11 female faculty members, including one Professor and three Associate Professors, representing 11% of the faculty as compared to the national average of 4.1%.

GENDER DIVERSITY ISSUES IN ENGINEERING EDUCATION AT UCF

This paper highlights issues related to gender differences in the engineering undergraduate student population at the University of Central Florida for the Spring and Fall 1994 semesters. Also, the results of a survey conducted in January 1995 to assess the educational climate for female students in the College of Engineering are included.

Methodology

Student Records data for the College of Engineering were requested and obtained via the Computer Services department of the university. These data sets were then analyzed using SPSS (Statistical Package for the Social Sciences). Survey questionnaires were mailed to the female engineering undergraduate students in January 1995; respondents returned the forms to the College of Engineering via the mail or a drop-off box. The responses were also analyzed using SPSS.

Findings

Undergraduates in the College of Engineering

For the Spring and Fall 1994 semesters, 2,009 and 2,116 undergraduates were enrolled in the College of Engineering. The statistical analyses first examined this population with respect to the following variables: gender, race, classification, major, historical student type, years at UCF, GPA, SAT scores, and age.

		SPRING 1994	FALL 1994
Gender:	Female	356 (17.7%)	369 (17.4%)
	Male	1653 (82.3%)	1747 (82.6%)
Race:	Asian	144 (7.2%)	154 (7.3%)
	Black	86 (4.3%)	104 (4.9%)
	Hispanic	212 (10.5%)	241 (11.4%)
	American Indian	6 (0.3%)	5 (0.2%)
	White	1496 (74.5%)	1540 (72.8%)
	Other	65 (3.2%)	72 (3.4%)
Classification:			
	Freshman	216 (10.7%)	325 (15.3%)
	Sophomore	158 (7.9%)	182 (8.6%)
	Junior	386 (19.2%)	378 (17.9%)
	Senior	1249 (62.2%)	1231 (58.2%
Major:	Civil	248 (12.3%)	264 (12.5%)
	Computer	213 (10.6%)	241 (11.4%)
	Electrical	412 (20.5%)	420 (19.8%)
	Environmental	293 (14.6%)	307 (14.5%)
	Mechanical	276 (13.7%)	275 (13.0%)
	Pending	76 (3.8%)	147 (6.9%)
	Other	491 (24.4%	462 (21.8%)

	SPRING 1994	FALL 1994
Historical Student Type:		
Beginner (FTIC)	724 (36%)	826 (39.0%)
Florida CC Transfer	1049 (52%)	1033 (48.8%)
Other Undergrad Transfer	215 (10.7%)	231 (10.9%)
Other	26 (1.3%)	26 (1.2%)
Time at UCF:		
1-4 years	1084 (53.96%)	1419 (67.1%)
5-9 years	479 (23.84%)	353 (16.7%)
Missing Values	446 (22.20%)	344 (16.2%)

Population means are given for the following factors:

		SPRING 1994	FALL 1994
GPA:		2.828	2.794
SAT:	Verbal	460	459
	Math	567	565
	Total	1027	1025
Age:		25.8	24.8
Years at UCF:*		3.8	2.9

Gender Comparison Issues within the College of Engineering

The female and male students were compared using several factors. Means are reported for SAT scores, age, years at UCF, and GPA; the total number of males and females are reported for the other variables.

	SPRING 1994		FALL 1994	
	Female	Male	Female	Male
Enrollment:	356	1653	369	1747
SAT: (average)				
Verbal	455	461	460	459
Math	547	571	550	569
Total	1002	1033	1010	1028
Age: (average)	25.4	25.9	24.3	24.9
Historical Student Type:				
Beginner (FTIC)	127	597	148	678
Florida CC Transfer	174	875	164	869
Years at UCF:* (average)	3.7	3.8	2.9	2.9

* Missing values accounted for 446 (22.2%) and 344 (16.3%) of the data points for the Fall and Spring 1994, respectively.

		SPRING 1994		FALL 1994	
		Female	Male	Female	Male
Classification:					
	Freshman	40	176	50	275
	Sophomore	25	133	35	147
	Junior	80	306	57	321
	Senior	211	1038	227	1004
Major:	Civil	50	198	53	211
	Computer	29	184	31	210
	Electrical	53	359	48	372
	Environmental	110	183	118	189
	Mechanical	24	252	24	251
Race:	Asian	36	108	37	117
	Black	22	64	23	81
	Hispanic	35	177	40	201
	Indian (Amer.)	2	4	2	3
	White	250	1246	253	1287
GPA: (average)		2.892	2.814	2.901	2.771
Academic Probation:#		3.93%	4.30%	4.07%	6.58%
Academic Excellence:#					
GPA 3.75 - 3.99:		4.78%	3.27%	5.69%	3.38%
GPA 4.00		0.84%	0.42%	1.08%	0.97%

#: These percentages are computed using the respective populations.

Female Engineering Undergraduate Experience Survey

The response rate was 19%. Seventy of the three hundred sixty nine female students enrolled in the Fall of 1994 responded to the survey. The response rate by classification was: Seniors 18%, Juniors 37%, Sophomores 20%, and Freshmen 2%. The survey results are summarized below.

A typical survey respondent was a Caucasian, single, 27 year-old, Environmental Engineering student, who worked less than 12 hours per week, had a GPA of 3.16, and was satisfied with her academic performance. This student first became interested in engineering during high school or in college and was primarily encouraged to pursue an engineering career by parents and other family members. She had chosen UCF because of availability of engineering program; she was resolute about not changing her major which had been decided prior to enrollment at the university. She attended high school in Florida and took advanced level courses in Mathematics and Science. She was a member of a professional organization and did not participate in community service activities.

The main factors for choosing engineering were: personal enjoyment, good pay, availability of jobs, and personal talents. The primary reasons for choosing UCF were: availability of desired major or program, urban location, overall cost, and reputation of departmental program. The most discouraging factors in engineering were: class schedules, difficulty of course work, lack of support from faculty, and gender discrimination. The most encouraging factors cited were: high interest in the discipline, too much time invested, supportive faculty, and female role models.

In general, the students felt that long years of formal preparation, competitive atmosphere in technical classes, limited opportunities for meaningful internship experiences in the field, and lack of information about work in scientific fields have contributed to the under-representation of women in science, mathematics, and engineering. They strongly felt that lack of contact with women in the scientific fields, and possible conflicts between career and family are big deterrents. They cited lack of information about work in scientific fields, inadequate academic or career advising, and limited mentoring experiences as being personal problems.

CONCLUSIONS

The undergraduate enrollment of women in engineering at UCF is 17%. The average age for both female students and male students is 25. The differences in SAT Mathematics scores and grade point averages with respect to gender were statistically significant. The proportion of female students on academic probation is less than the corresponding proportion of the males. The analysis also showed that a larger percentage of female students maintain high grade point averages (3.75 - 4.0) as compared to their male counterparts. Environmental Engineering attracts the most women (38%), while male students dominate the disciplines of Computer, Electrical, and Mechanical Engineering, with greater than 86% representation. The results of the survey on the engineering experience for female undergraduate students revealed that these students were very enthusiastic about their major and field of study, and that they needed better advisement and more female role models.

CAREER AND FAMILIAL CHOICES OF MEN VERSUS WOMEN IN HIGHER EDUCATION: THE REALITIES OF EQUITY

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In 1990, 57.5 percent of all women age 16 or over were in the labor force, and it is estimated that by the year 2000 this percentage will have reached the mid-seventies (Lindsey, 1994; Ries and Stone, 1992). This trend, if long-term, will ultimately result in the convergence of male and female labor force participation rates.

This new directional vector has not developed without concomitant problems for many of our social institutions, including higher education. For instance, even though the numbers of women are rising, the majority of them are still located in low-paying, boring jobs with no future for growth. Even professional women have found doors for advancement have not opened at the rate that social, legal, and political action had hoped to attain. It is clear that men and women follow different career paths as they attain similar educational levels and enter the workplace.

The purpose of this paper is to address the cultural, emotional, vocational and familial variables affecting professional men's and women's choices, whether chosen and/or imposed, regarding career and family issues in higher education. As we strive to recognize the genesis of such occurrences, a sense of resolution should contribute to increased productivity and the psychological well-being of the entire workforce, but particularly women who have faced traumatic dilemmas in attempts to balance the two most important forces in their lives: careers and families.

Defining the Impact of a Larger Culture: The Societal Environment

As Bell and Chase (1993) report, previous research attributed women's lack of leadership roles to their internal lack of leadership aspirations (Estler, 1975). Even though Adelman's 1991 study confirmed that parents set lower aspirations for daughters than sons, Widnall (1988) reports that a study at Stanford University (Zoppert and Stanbury, 1984) shows no significant difference between the aspirations of men and women college freshmen. Additionally, the number of freshmen women who plan to complete terminal degrees has increased significantly in the last 20 years (Astin, 1990). In view of these educational aspirations, it is not surprising that men and women's career choices are more convergent than before (Astin, 1990). Therefore, the hypothesis that women's lack of leadership roles can be more attributed to external factors than internal barriers seems logical (Estler, 1975; Bell and Chase, 1993).

Although various studies of the 1960's and 1970's indicated that women were more likely than men to lower their career aspirations (Adelman, 1991; Bayley, 1990), recent findings show that this process cannot only be stopped but also reversed. Henley and Bartle (1990) found that participating in Women's Studies increases career aspirations for all women and significantly so for women of color. A study by the Commission of Professionals Science and Technology (1987) suggests that women are more likely to be self-supporting and to have less confidence in their abilities than males (Widnall, 1988). Widnall (1988) also suggested that the lowering of aspirations and the dropping out of graduate school could be stopped with sensitivity to women's needs/roles by higher education institutions.

Therefore, it seems that women's aspirations, fulfillment and success can be increased by 1) providing and encouraging participation in Women's Studies, 2) educating parents, teachers, and females about career choices, 3) increasing internships and work programs that allow leadership roles for women, 4) increasing financial support for college women, 5) increasing campus sensitivity to the dual roles of women, and 6) increasing sensitivity to discrepancies in educational opportunities due to gender.

Examining the Supportive Organizational Culture

Along with changing the socialization patterns for women should be changes in the organizational structure that will diminish differences in career paths for males and females. Berger and Foster reported that societal standards contribute to inequitable expectations and policies. For instance, society continues to perceive men's careers as more important than women's. (Barbee, 1990, p. 107). With emphasis on men's careers, women have not institutionalized primary sources of "information and support" associated with the benefits of male-oriented, informal networks (Wood, 1994, p. 284). Both formal and informal networking fulfills many needs for men, and potentially women, in higher education. Examination of that organizational norm should be re-visited as more women enter professions and positions traditionally confined to men.

It is evident that institutional practices impact directly career opportunities for women in higher education. Although these practices should foster the success of women rather than place obstacles in their paths, existing barriers to "advancement, including promotion, tenure, and academic administrative promotions, can create an atmosphere on campuses that continues to send the message that women are not first class citizens" (Texas Higher Education Coordinating Board, Austin, 1991, p. 19). Hiring procedures may also make it more difficult for women to work at institutions of higher learning.

Further, organizational culture appears stagnant in proactively providing equal career and financial opportunities for women. Lindsey, asking the question, "Where does the academic path lead for women Ph.D.s?" reports that most serve "...in two- and four-year state colleges...with heavy teaching loads and administrative responsibilities... . They are likely to be instructors and assistant professors" (Lindsey, 1994, p. 276). Following existing trends "...the prevalent prediction for the next 20 years is that women will continue to inundate lower and part-time faculty ranks and suffer the brunt of economic constraints in education" (German, 1989, p. 13). Although more women are entering the world of higher education, few institutional incentives promote their long-term success in positions of prestige and authority.

Addressing the Need for Emotional Support Systems

The typical work environment defines women as outsiders, therefore complicating their "work lives in ways men seldom experience" (Wood, 1994, p. 283). Personally, this conflict for women is especially painful because their innate nature values relationships among colleagues as a precursor to their "sense of fit." The organizational climate in higher education continues to promote, if in a subtle fashion, cultural and structural deterrents that are not only internal but also external barriers to the emotional health of women employees and therefore the organization (Marshall, 1993).

Relationships with colleagues are crucial to personal and job satisfaction. Because most informal networks are largely or exclusively male, women often feel unwelcome. Further, "feminine socialization does not encourage them to assert themselves and claim position in a group" (Wood, 1994, p. 284). In fact, women feel a sense of tokenism and in attempts to bond with men eventually emulate typical male behavior including talking loudly and using profanity. As a result, women avoid networking which is a primary source of communication and support (Wood, 1994).

In the world of higher education, a mentor is more than a trusted friend, s/he is a "senior colleague who advises and assists a junior employee in building a career" (Wood, 1994, p. 284). Unfortunately, women are much less likely to have mentors than majority men (Wood, 1994). Even in graduate school, female "graduate students spend less time with faculty, are less relaxed when they do, and feel they are not suitable" as mentees (Lindsey, 1994, p. 275). Women continue to be isolates in this male-dominated environment for numerous reasons, including that men sometimes feel uncomfortable mentoring women for fear of sexual connotations or innuendoes. Further, men may simply feel uncomfortable working that closely with women because of a lack of knowledge about female development and psychology. Whatever their reasons, this practice "perpetuates the status quo in which white men gain assistance in climbing the corporate ladder while women...receive little help" (Wood, 1994, p. 284). Women usually have no one to assist them in shaping their experiences to gain access into the present system, but many have not actively pursued mentor/mentee relationships and the subsequent benefits.

It is obvious that organizational structure can be designed to enhance, or conversely, limit opportunities for women. Women who are already working in higher education should continue to strive for change within the university system.

Creating a Positive Familial and Career Balance

According to Hensel (1991, p. 2) "nearly one half of the women who stay in academia remain single or childless, which raises the question of how work/family conflicts influence the choices women make." A faculty career is demanding with the average professor working approximately 55 hours per week (Hensel, 1991; Bird, 1984; Dublon, 1983; Weishaar, et al., 1984). When other responsibilities are added for the woman in higher education, such as child care and home maintenance, a woman can work 70 or more hours per week (Hensel, 1991). Also, women in higher education who choose to have children are often pursuing tenure or promotion during the peak of their childbearing years (Hensel, 1991). The consequence of this situation is that women are less likely to "succeed" in the traditional sense in higher education because of the structural constraints placed upon them by attempting to have both a family and career. It has been noted that women in academia continue to be paid less than men, are promoted more slowly and receive tenure at lower rates (Manning, 1993).

A number of recent studies have examined differences in career paths and success for men and women in higher education and have noted the areas of greatest concern for individual related to the issues of family (Selke and Collins, 1994; Weishaar, et al., 1984, Bird, 1984; Dublon, 1983). Weishaar, et al., (1984) noted that the most often cited concern about balancing family and career was "too much to do" rated first with "pressure to do well" rated second.

How, then, can colleges and universities create an environment that is supportive for both males and females in relation to family? Institutions can provide opportunity to stop the tenure clock for one year, thus allowing women the opportunity to adjust to the addition of a family member without the added pressure of the tenure clock ticking away. A second and third change might be to provide on-campus child care/elderly care or the opportunity for flexible schedules that allow faculty members, within reason, to work classes around family obligations.

Conclusions and Implications

Research has shown that structural and personal constraints impact the aspirations and level of success for women in higher education. It is anticipated that this will continue to be the case as data obtained for this analysis are examined. It is apparent, as well, that this impact is detrimental in most instances. Hopefully, however, as more and more women pursue graduate education and consequently, faculty and administrative positions, that colleges and universities will find it necessary to create an environment that will take into consideration the 'total' employee. Such a stance would result in the implementation of policies, such as the ones mentioned, to enhance the satisfaction, achievement, and productivity of women in higher education and will reduce the variance between men's and women's socialization and subsequent career paths.

More importantly, women must refuse the role of "passive recipient" in male-dominated organizations. Women must actively embrace the sometimes painful growth, conflict and resolution in their quest to "own the change" that needs to happen--for our world, for our children, for us.

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Girl Scouts: Discovering Ourselves in Math and Science
A Model Program

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Introduction

As noted in the recent AAUW report, How Schools Shortchange Girls (1992), significant gender differences exist relative to math and science attitudes and achievement. Despite the fact that girls' math grades are as high or higher than boys', girls' confidence in their ability declines as they progress through elementary school. This lack of confidence precedes a decline in achievement during the middle school years.

According to the report, the gender gap in science appears to be increasing. In contrast to girls, boys have more out-of-school science experiences, take courses in a wider range of scientific disciplines, and are more likely to be asked to help with science demonstrations in the classroom. Girls typically consider science and math masculine activities and often elect to take fewer science courses even when they are doing well.

Although a lack of interest and sense of competence in math and science penalize individual girls and women, it also has dire consequences for our society as a whole. According to National Science Foundation data (1990), only 16 percent of women are employed in science and engineering despite the fact that women constitute 45 percent of the labor force. Along with a general decline in interest among white males, the lack of representation of women in science, math, and engineering poses the problem of a limited talent pool.

Based on a review of the relevant literature, Clewell *et al.* (1992:5) observed that the underrepresentation of women and minorities in math, science, and engineering fields

> are varied and complex. Research into these causes has revealed that females and minorities face similar barriers to participation in these fields: (1) negative attitudes regarding mathematics and science [based on gender stereotypes]; (2) lower performance levels than those of White males in mathematics and science courses and on standardized tests of these subjects; (3) limited exposure to extracurricular mathematics and science and failure to participate in advanced mathematics and science courses in high school; and (4) lack of information about and/or interest in mathematics- or science-related careers.

Conversely, the encouragement of teachers and participating in career conferences or summer camps in math and science are associated with taking higher-level math and science courses among girls (AAUW, 1992).

In response to these barriers, the three primary goals of the Girl Scout math and science summer day camp were (1) to increase interest in science and math among participants, (2) to increase the sense of math and science competence among participants, and (3) to increase the likelihood that Girl Scout leaders will provide science and math activities throughout the school year.

In order to realize these goals, the science and math camp was organized around the following objectives: (1) to provide a variety of science and math activities that would stimulate interest among participants with a wide range of interests and abilities; (2) to introduce age-appropriate science and math content, as well as develop process and observation skills; (3) to provide experiences that demonstrate the relevance of science and math to the everyday activities of participants; (4) to allow for extensive and intensive interaction with women scientists who serve as positive role models, and (5) to encourage Girl Scout leaders to conduct age-appropriate science activities with participants as a follow-up to the week-long camp.

The willingness of women faculty to participate in the camp was especially important. As suggested by Bandura's (1977) social learning theory, children learn which gender role behaviors are appropriate for males and females by observing adults. By observing women professors actively engaged in a wide range of scientific disciplines, it was hoped that the girls would increasingly identify science and math as gender-neutral activities.

The Model Science and Math Camp

The Girl Scout science and math camp was a collaborative effort that began when the local American Association of University Women (AAUW) wanted to encourage girls in science and mathematics as part of their national *Initiative for Educational Equity*. As members from the university community and Girl Scouts became involved, the idea developed into a week-long science and math day camp for Girl Scouts. Held during the summer of 1994 with 102 girls, the day camp was conducted on the Georgia Southern University campus, using facilities ranging from the Continuing Education building, to computer and science laboratories, to the Botanical Gardens and campus planetarium.

The logistics of scheduling and supervision were managed by local Girl Scout leaders, with each day including opening and closing sessions, lunch and snack breaks, and science/math sessions. The project was funded by a small Faculty Service Grant from Georgia Southern University. This $4000 grant, along with $25 registration fee per girl, was used to cover the cost of all materials and supplies for the camp. The camp was able to operate on such a small budget because all of the personnel--including administrators, volunteer leaders, and professors--donated their time.

Women science and mathematics faculty at the University were contacted in order to determine who was interested in participating in the program. The response was overwhelming, with over 20 women professors from 13 different departments or programs sharing their expertise and excitement with campers. Each session was designed by professors who provided hands-on experiences related to their specific disciplines. Each session accommodated 25 Brownie, Junior, or Cadette Girl Scouts.

In the area of **human anatomy and development**, the girls dissected fetal pigs, examined a human brain, and designed a skull to protect a water balloon model of the brain. In order to test the effectiveness of their model skull, the girls took it outside to see what would happen when it fell "head first" on the ground. Using dual stethoscopes, the girls listened to their hearts and lungs while a nursing professor explained what they were hearing. In addition, a nursing student allowed the girls to listen to the heart beat of her eight-month-old fetus. Finally, concerns about health, fitness, and diet were addressed through activities dealing with proper nutrition, weight, and exercise.

In **chemistry**, the girls observed the characteristics of various elements. Concepts such as freezing point, evaporation, and sublimation became more relevant after the girls hammered a nail with a banana dipped in liquid nitrogen and observed the properties of liquid nitrogen as it was poured onto the ground. They also created "slime" in the chemistry lab, wrote secret messages with invisible ink they created, and cleaned pennies with vinegar and salt.

In **botany** and **zoology**, the girls identified and classified plants, then made bookmarks using plants they found at the Botanical Gardens. After learning about the importance of composting, they prepared soil for transplanting different types of flowers and took these flowers home for their garden. Sea turtle research from Georgia's barrier islands was brought inland and provided an opportunity for the girls to learn about what is being done to save the Loggerhead turtles native to this area. The girls conducted research on mock nests containing ping pong balls and drew conclusions based on scientific principles. In addition, the girls observed snails--including their ability to move across the edge of a razor blade without being cut, and a psychologist demonstrated how behavioral research is conducted with pigeons.

The complete range of sessions included: animal behavior with pigeons, art as math, biology lab, botanical gardens, chemistry lab, fitness activities, graph-making skills, map-making lab, nursing lab, physiology lab, planetarium, and sea turtles.

Program Evaluation Strategies

In order to assess the effectiveness of the program and provide information for groups considering similar programs, multiple methodologies were used to conduct an evaluation of the science and math camp. First, pre-test and post-test questionnaires were completed by participants in order to assess whether interest in science and sense of science competence was different after attending camp. Science attitudes were measured with a modified version of the Fennema-Sherman Mathematics Attitude Scales II (1976). Pre-tests and post-tests were completed by 83 and 82 girls, respectively; 63 of the girls would be entering 1st through 5th grade and 18 would be entering 6th through 10th grade in the fall. Data concerning math attitudes were also collected and analyzed. However, this article focuses on science attitudes because very few of the sessions dealt exclusively with math.

Second, volunteer leaders completed open-ended debriefing questionnaires at the conclusion of camp. In these, they described the girls' responses to various activities, the overall effectiveness of the program, and ways in which the program could be improved. Lastly, follow-up questionnaires were mailed to the home of each participant half-way through the next school year in order to assess longer-term effects of the program. These questionnaires were completed and returned by 29 of the girls; 27 included responses from both the girls and their mothers.

Impact of the Program

Anecdotal data suggested that the initial response to a math and science camp was less than enthusiastic among some girls and parents. Accustomed to day camp emphasizing outdoor activities and crafts, several girls made negative comments about "having to do science" during day camp, and one of the fathers voiced concern that the camp would train his daughter to become a radical feminist. Comments such as these raised concern about the eventual success of the science and math camp but also helped demonstrate the need for this type of camp.

According to questionnaire data, mothers felt significantly more positive about the idea of a math and science camp when it was first announced than did their daughters.[1] On a scale of 1 (very negative) to 7 (very positive), the mean parental response was 6.46 (moderately positive) with a median of 7.00 (very positive). The girls' mean response was 5.11 (somewhat positive) with a median of 6.00 (moderately positive). Volunteer leaders noted that the younger girls tended to have more positive expectations of science and math camp.

In the debriefing questionnaire, a Brownie leader observed that "the girls seemed to gain momentum and enthusiasm as the week progressed" and were soon exclaiming, "What's next?" and "Now what are we going to do?" A Cadette leader concurred, observing that "one girl changed from 'I like Scouts but hate camp' to 'This is all right except for walking.'" Another member of her group was pleasantly surprised that "this isn't like school at all." A Brownie leader overheard her girls saying, "I love math," "This is great," and "I want to be a scientist."

Overall, leaders observed that girls responded more enthusiastically when materials were openly displayed, there were a lot of hands-on activities, and the girls could move around. Activities about which half or more of the girls felt "very positive" included botanical gardens, chemistry lab, dissecting the fetal pig, fitness activity, and graph-making activity for younger girls. Almost nine-tenths remained very impressed with one or more activities even half-way through the next school year. Dissecting the fetal pig was mentioned most often, followed by making "slime," examining the human brain, and visiting the planetarium.

In addition, younger girls were more likely to "bond" with instructors. A Brownie leader observed that "when writing with 'invisible ink,' several girls directed 'love notes' toward [the chemistry professor] and in one instance wrote, 'I love science.'" A Brownie also told one of the instructors that she would see her again. When the instructor reminded her it was the last day of camp, the girl explained she would see the instructor when she took classes as a college student at the university.

The response of the girls was not entirely positive, however. A junior leader observed that

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[1] Considering the impact that fathers' gender role norms impact daughters' self-concept, data pertaining to fathers' attitudes would also be meaningful.

> the girls who came to camp excited stayed excited. Some were unsure and quickly became excited. Those who came to camp with an attitude that they would not like camp [left] that way, but each [had] a few exercises they enjoyed.

Science attitude index scores. Before attending camp, the mean sense of science competence score for younger girls (entering grades 1-5) was 15.45, and the mean score for older girls (entering grades 6-10) was 13.94. The potential range was 5 to 25. The t-value of 2.73 indicates that the older girls felt less competent to learn science than did the younger girls at $p=.01$. This finding was supported by Pearson correlation analyses that revealed that older girls were significantly less likely to feel they could handle more difficult science problems ($r=-.32$) and or were competent to learn science overall ($r=-.36$) at $p \leq .05$.

Before attending camp, there was no statistically significant difference between the younger and older girls' overall interest in science. However, correlation analyses revealed that older girls were less likely to like science projects ($r=-.31$) or find science fun and exciting ($r=-.31$) at $p \leq .05$.

According to t-test analyses, the younger and older girls' interest in science and younger girls' sense of science competence did not change significantly during the week of camp. However, the older girls' mean sense of science competence increased from 13.94 to 15.22, a statistically significant improvement at $p \leq .05$. Although younger girls reported a stronger sense of science competence before attending camp than did older girls, this difference no longer existed by the conclusion of the camp.

Because the index measuring science interest emphasized "working" on difficult problems for lengthy periods of time, it is possible that important changes in attitudes may be been undetected, especially among younger girls. Indeed, other measures indicated that interest in science had increased as a result of the science and math camp.

Participating in "dreaded" activities. According to the follow-up questionnaire, 59.3 percent of the girls dreaded one or more activities that would be included in the camp schedule. Dissecting the fetal pig was cited the most often. After participating in these "dreaded" activities, 3 girls had a negative response; 1 had a neutral response, and 6 of the girls reported they had had a moderately positive or very positive experience.

Attitudes towards school science classes. According to follow-up questionnaires, 1 girl felt more negative, 13 felt the same, and 9 girls felt more positive about their school science classes after having attended science and math camp. In 11 cases, parents attributed at least some of this difference to the science and math camp.[2] One third grader had "become very interested in experiments," and the mother of a fourth grader stated that "[my daughter] got to see the vital organs of the pig which makes it easier to study the internal studies [sic] of humans."

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[2] Some parents who reported no change in attitude based on the scale of 1 to 7, checked the statement that the change was due to camp and described a positive change in attitude toward regular science class.

The mother of the girl with more negative attitude attributed this in part to camp--because science at camp was more interesting than science in the classroom.

A current tenth-grade Scout wrote that "[camp] made me want to learn more about science," and other parents explained that "Girl Scout camp made it fun" and "I think it showed the fun and importance of science outside the classroom." The mother of a fourth-grader reflected that her daughter is more interested in science

> because she enjoys the "hands-on" [experiments]. She liked the women who led the activities, too. . . . A great experience!! Thanks! Too bad public elementary/middle schools can't do more labs and make science/math more interesting. My daughter gets bogged down with the "book." She hates the endless worksheets.

Attitudes toward attending a science and math camp. Data from the follow-up questionnaire revealed that the girls felt significantly more positive about science and math camp after attending camp than they did before at $p \leq .001$. The mean attitude before attending camp was 5.11 (somewhat positive) while the mean score after attending camp was 6.48 (between moderately and strongly positive). The mean response to attending a similar camp in the future was 6.33.

Parental support is essential in maintaining positive science attitudes. Support among the participants' mothers was consistently high with a mean of 6.43, 6.82, and 6.75 (all between moderately and strongly positive) relative to pre-camp, post-camp, and future camp attitudes.

Summary

Research clearly shows the importance of out-of-class science and math experiences, positive female role models, encouragement, and exposure to a range of science and math activities in cultivating science interest and competence in girls. The following results were obtained through this model science and math camp for Girl Scouts: (1) increased sense of science competence among older girls; (2) more positive attitudes towards science and math camp and activities for younger and older girls; and (3) improved attitudes towards school science class for a substantial proportion of the participants.

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INCORPORATING DIVERSITY IN BUSINESS EDUCATION-AN ASSESSMENT

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INTRODUCTION

The curriculum in many business schools has been changing in the past decade, with greater attention paid to issues of interest to women. This has come about in part because of the greater presence of females on faculties, in part because of pressure exerted by external forces such as employers and accrediting bodies, and in part because of intellectual challenges within and without the business disciplines. Scholarly journals, professional meetings and accrediting organizations have all discussed the need to rethink material, teaching methods and the dominant paradigms in the fields comprising business education (including marketing, management, finance, and accounting, among others) in light of gender issues. Gender, race, class and sexual orientation are all variables now mentioned in at least some business texts. But how has this attention to women and other groups actually translated in the classroom? What techniques seem to work most successfully?

Students in business classes have been changing as well as the curriculum. Women have entered this historically male dominated area in increasing numbers over the past two decades. What are the implications of this gender shift? Are there are ANY indications that business professions will lose status, as has typically occurred in other fields as numbers of women increased? Do women do better in fields where written work is of most importance (e.g. accounting, finance) and less well in fields (such as management and marketing) where speaking up in class and aggressiveness are rewarded? How comfortable is the atmosphere for these females flooding the business classrooms?

Answers to these questions are not easily forthcoming, but such issues must be addressed when attempting to assess curriculum transformation efforts in business education. Increased numbers of women in business classes do not by themselves tell a successful story, particularly if women in those classroom feel they must modify their behavior to fit into the business world, in the classroom and afterward.

CURRICULUM TRANSFORMATION IN BUSINESS SCHOOLS

Over the past decade a number of business schools have undertaken curriculum transformation efforts, either as a project for the entire school, or in individual disciplines and classrooms. These efforts have come about for a variety of reasons, including external institutional and business forces, changes in the demographics of faculty and student body, and intellectual transformations within the disciplines.

In 1991, the body that accredits business schools, the AACSB, pronounced demographic diversity (including inclusion of women) a necessary focus for the future and incorporated attention to this phenomenon into their new guidelines. College administrations also have been looking favorably on efforts to revise curriculum to better reflect the diversity of the American population, and have at times made monies available to pursue and reward such efforts. Such external pressure have provided both a carrot and a stick to business schools to evaluate and change both policies and curriculum.

A less immediate but perhaps ultimately more potent force for persuading business schools to look at the issue of gender (as well as race, ethnicity and sexual orientation) has been the business world itself. Businesses have recognized that both the workforce and the marketplace are composed of increasingly diverse populations. Women have always been valued consumers for businesses in the marketplace. But as they have flowed into the workforce in ever greater numbers, women's consumer behavior has changed; businesses have had to respond to these changed behaviors. Also, managers now have to supervise, work with and report to women. Many companies have undertaken extensive training programs to sensitize their current workers. But they expect business educators to prepare incoming employees to work effectively in a diverse environment.

More and more women are teaching in business schools (Carsky, Kennedy, and Zuckerman 1990). Their presence as role models is an encouraging one. Women can offer different perspectives, although the training they undergo may lessen such differences with their male colleagues. Intellectually female business academics may ask different questions and see different issues as important to stress in the classroom, and to pursue in their own research, which then spills over into the classroom (Aisenberg and Harrington 1988; Belenky, et al 1986; Ferber and Nelson 1993). Women may use or emphasize different research methods (Hudson and Ozanne 1988; and Reinharz 1992). Scarcity of business academics have created another force for diversity in business school thinking; shortages have led some business schools to hire faculty trained in non-business disciplines (e.g. psychology, sociology, anthropology, and law) to teach in their departments, which also leads to viewing knowledge in a new way.

The composition of business classrooms is also changing, forcing shifts in the disciplines. Increasing numbers of women are in the business classrooms and are graduating from business programs. This trend should continue, as efforts on the primary and secondary level intensify in terms of encouraging women to pursue interests in fields such as math that will prepare them for business courses such as accounting and finance.

CONTINUING PROBLEMS

Despite forces for making business schools more

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hospitable environments for females, a number of problems remain. Some business faculty question the focus on women and diversity in the curriculum. Departments and administration are not always supportive, or not supportive in concrete ways, such as providing money and/or time to incorporate new approaches in courses or engage in full-scale curriculum transformation. This is especially true in today's environment when many colleges are downsizing and having budgetary problems. Curriculum transformation becomes a "frill." Because rethinking course material and developing new approaches to learning takes time and energy, faculty may be reluctant to do so if there is little or no reward for such work.

The business world itself is frequently socially conservative. Business people in the community tend to be supporters of the status quo. In academia the field typically attracts relatively more traditional faculty and students than, for example, the liberal arts. This may make gaining support for efforts to revise the curriculum require continuous justification. It also raises the issue for business school faculty of whether we are "overpreparing" our students in terms of gender issues, making them more progressive on this issue than the businesses they will join.

Students, faculty and administrators in business schools are also affected by the general backlash against feminism which has occurred recently. Spokespeople for this viewpoint argue that all women's battles are won, and we are now a gender-neutral society. Therefore special efforts are no longer needed for tending to the concerns and interests of women as a group (Faludi 1995).

TOOLS FOR CONTINUING CHANGE

In thinking about making business classrooms even more accessible and effective learning environments for females and other diverse student groups, business faculty need to keep reevaluating the curriculum. In so doing, we must ask ourselves to what extent we have rethought the nature of the material we teach and how we teach it. Some methods have proven useful in these areas.

Most major business fields have undergone some self-scrutiny with respect to incorporating issues concerning gender as well as feminist thought into their core material. Franzosa and Massa have offered a model which is useful for reconceptualizing curricula in any discipline (Franzosa and Massa 1989). The first focus is on the selection of knowledge to be taught. Bias can occur in the selection process, leading to the inclusion and exclusion of information and ideas. To uncover such bias, we can review the content of our courses and ask: Why is certain material included and other information left out? Whose material and ideas are represented? What values does the selection of this material serve? Does the curriculum include the experiences of women and/or other traditionally underrepresented groups? Does it discuss their experiences accurately?

Next, we must consider knowledge construction. This involves questioning established assumptions that underlie acceptance of particular research methods and ways of theorizing. For example, research designs that exclude women or people of color as subjects, or that discount the legitimacy of qualitative research are just two ways of constructing knowledge, based on a specific set of norms; these can be questioned. Do methodological procedures exist in this field which limit our knowledge of the experiences of women and people of color?

We must also think critically about the interpretation given to research results. This means recognizing that knowledge is not value-free and objective, but rather susceptible to various interpretations depending on the prism of the researcher. This can be an uncomfortable concept for students, but a crucial one one to bring up.

A third area pointed to by Franzosa and Massa focuses on knowledge distribution. Who has been barred from or limited in obtaining this knowledge? What is the demographic make-up of the classes? What are we doing to encourage or discourage diversity? This is particularly important in business fields, where certain groups, including women, have historically been underrepresented.

Looking at how knowledge is legitimated can be important. This involves understanding what and why certain types of language and inquiry are considered the best and in a field, and how institutions (such as professional associations, journals, etc.) legitimate that. For example, studies of the marketing field have shown that males (mostly white) have dominated the editorial boards of the top three journals (Carsky, Kennedy and Zuckerman 1990). We need to be aware of the impact this makes on topics chosen for research, research methods used, and studies presented and published.

Our teaching methodologies also must be rethought. How knowledge is presented affects the way students learn and use information. Is the classroom one where students feel comfortable raising questions, or in critiquing ideas? Can women relate the material as easily as men?

A variety of tools can be used to further this transformation of material in the classroom. Primary research projects are often useful in helping students question stereotypes presented in texts and in their own thinking, and can be incorporated in a variety of business classes. Students start out by formulating their own hypotheses, or identifying those of other researchers. Next, they design and carry out their own research (surveys, experiments) to test those hypotheses. The class as a whole critiques the proposed research for biases inherent in the research designs themselves. After collecting and analyzing data, students examine how it holds up against the preconceptions they held. For example, in an advertising research course I taught, students developed the hypothesis that women would be offended by sexual stereotyping in advertising but that men would not. This hypothesis was fostered by reading done in the courses on gender differences in information processing. Some students felt uncomfortable with the readings, arguing that they portrayed one sex or the other negatively, and they were given a chance in the class to discuss their feelings. The material prompted the students to undertake the research, and deal with a number of questions which emerged, centering on the difficulty of conducting value-free research (Zuckerman and Carsky 1991).

A basic but effective technique for supporting gender equality in the classroom is to ensure that texts and cases chosen for fairly depict females and other traditionally underrepresented groups in examples, problems and cases. Many textbook publishers are responding to demand for this kind of material, and faculty members are developing it as well (Institute for Case Development and Research 1991; Kellermeier 1992). If such material is lacking in certain areas, schools can appoint a part-time researcher to collect material from the business press reflective of women's participation in business. Faculty members can then draw on such material for classroom use (Coulter, Edgington and Hedges n.d.).

Group exercises and collaborative learning can enhance communication among diverse students. Having students work in groups, self-monitoring that process, facilitates cooperative learning. Group work also forces students to confront their own feelings about difference. While this can be a useful learning experience, for students to gain the maximum benefit from such exercises may call for facilitating skills that many faculty simply do not have. For example, in a recent organizational behavior class I showed a series of training tapes used by a large local organization to sensitize their managers to issues of diversity. The students responded with interest. However, I felt the discussion could have been pushed further, to uncover deeper feelings. Yet I was unsure about how to do such prodding, and a bit nervous about how to handle some of the negative feelings (e.g. hostility and resentment on the part of white males) that I might discover. One solution is to bring in outside lecturers, better trained in group dynamics techniques. The use of outside lecturers generally exposes students to greater variety within the business classroom, sending the message that diversity is positive.

ASSESSMENT

Clearly some steps toward greater gender equity have been taken in business schools. More females teach on business school faculties, and female students flow into business classrooms in ever greater numbers. However, faculty in business schools continue to need support, from institutions and from the business community, to continue their efforts to address gender issues in the classroom. A need exists as well for additional research into how women do once they leave the classroom and enter the business world. Reports indicate that women do not progress as rapidly or as far as their male counterparts in corporations, despite comparable or superior academic records. Research into the reasons for this differential progress as well as development of strategies to overcome it would be appropriate activities for business schools and their faculty. This would enable them to assist their female students not just in the classroom but beyond. Students and future workers of both sexes would benefit.

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PROPOSALS ACCEPTED BUT PAPERS NOT RECEIVED FOR INCLUSION IN THESE PROCEEDINGS

INTEGRATING WOMEN'S ISSUES INTO THE CURRICULUM: A MODEL FOR THE "HELPING PROFESSIONS." (Paper)

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University of Central Florida

ENGINEERING FACULTY ENCOURAGEMENT FOR THE K-12 GIRL. (Paper)

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Lawrence Technological University

JOB SATISFACTION AND ITS CORRELATES AMONG WOMEN MASS COMMUNICATION EDUCATORS. (Paper)

Beverly Suzanne Bailey
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"EQUITY ACHIEVED!": HORIZONS 2000, AN INNOVATIVE, FIELD-TESTED CURRICULUM MODEL FOR GRADES 5-12. (Paper)

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Cassandra N. Nichols
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NEGOTIATING THE MAZE: GENDER AND MULTICULTURAL EDUCATION. (Panel)

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Susan Shome
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Nancy Owen Nelson, Editor Foreword by Jane Tompkins

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